Fig.1

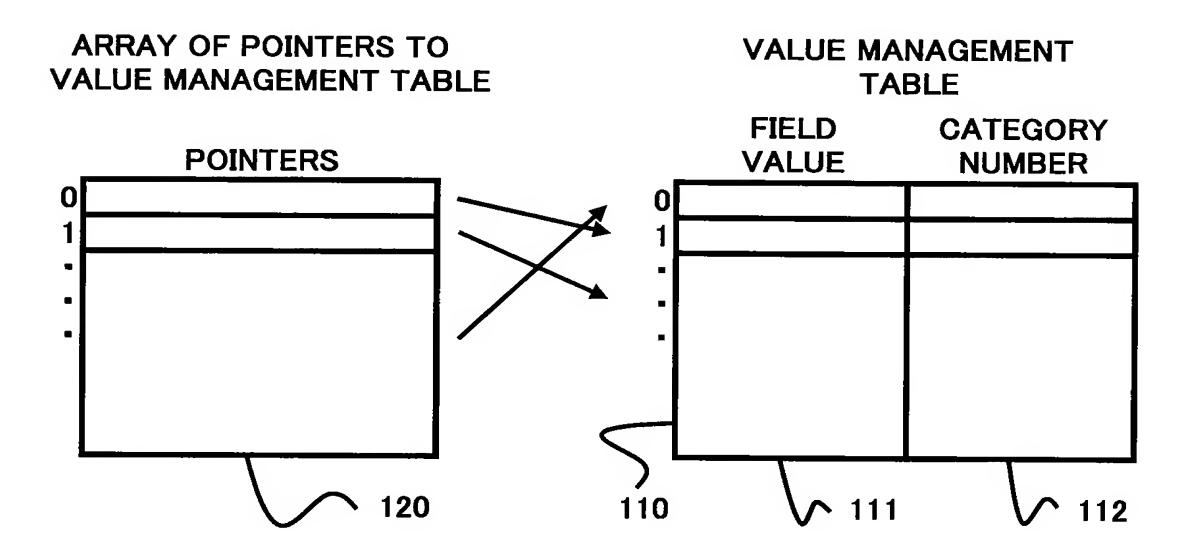
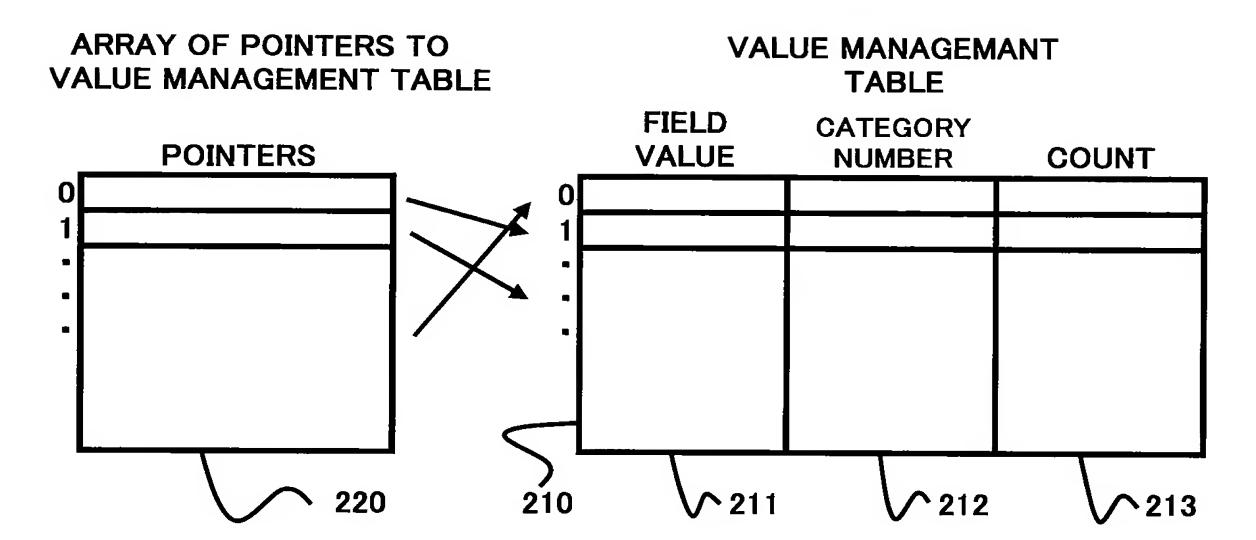


Fig.2



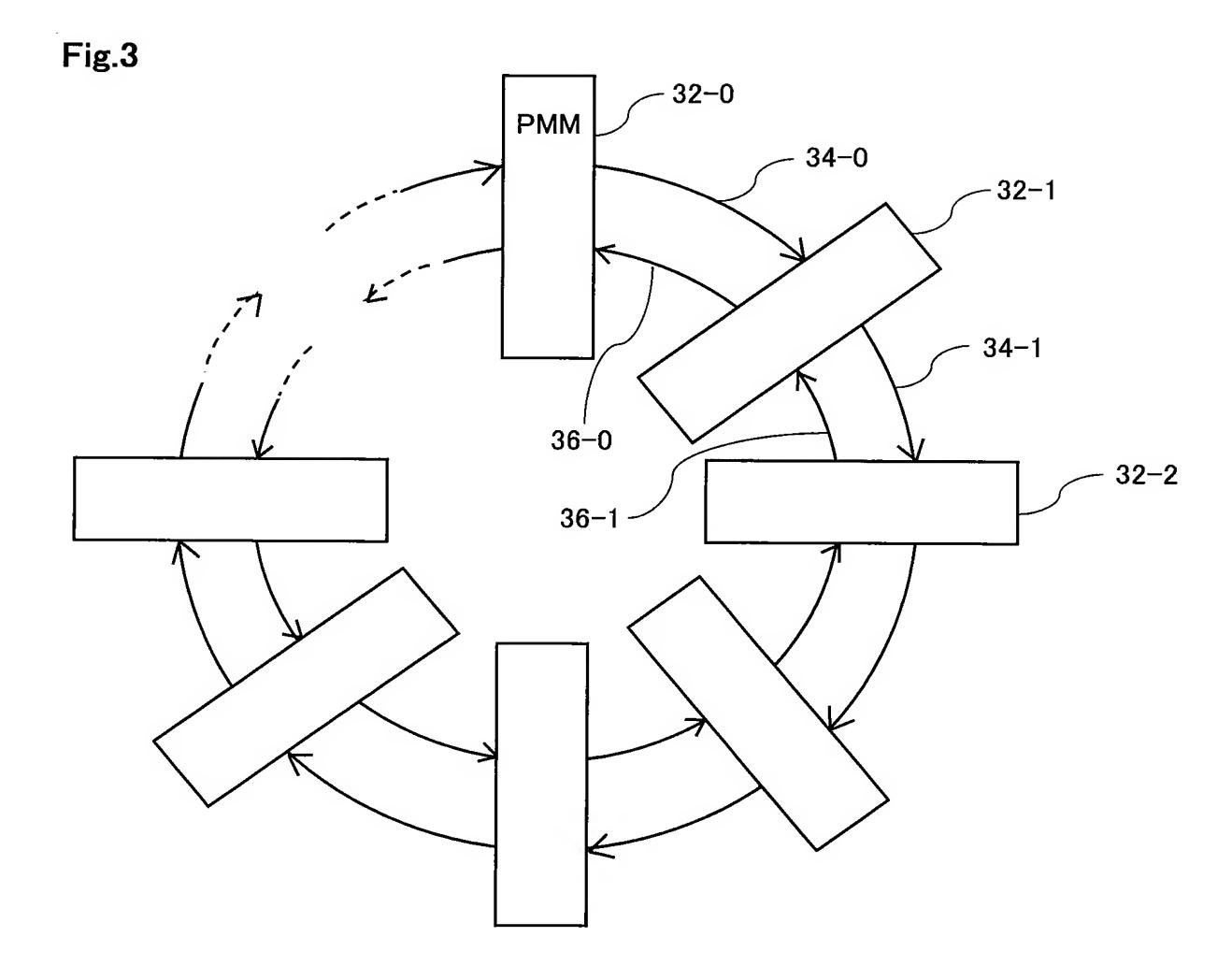


Fig.4

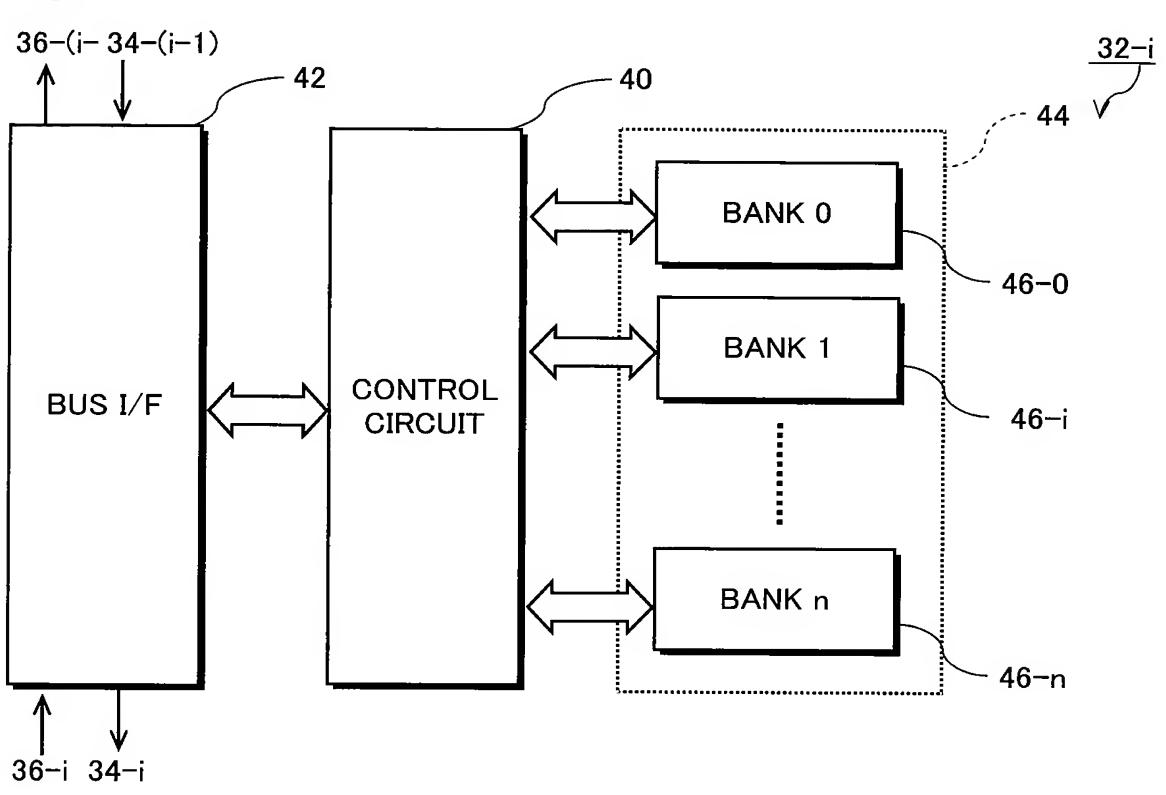


Fig.5

RECORD NUMBER

R	SEX	AGE	HEIGHT(cm)
0	FEMALE	3	78
1	MALE	1	82
2	FEMALE	2	69
3	FEMALE	1	82
4	MALE	3	91
5	FEMALE	1	76
6	FEMALE	1	78
7	FEMALE	2	84
8	MALE	3	87
9	FEMALE	3	80

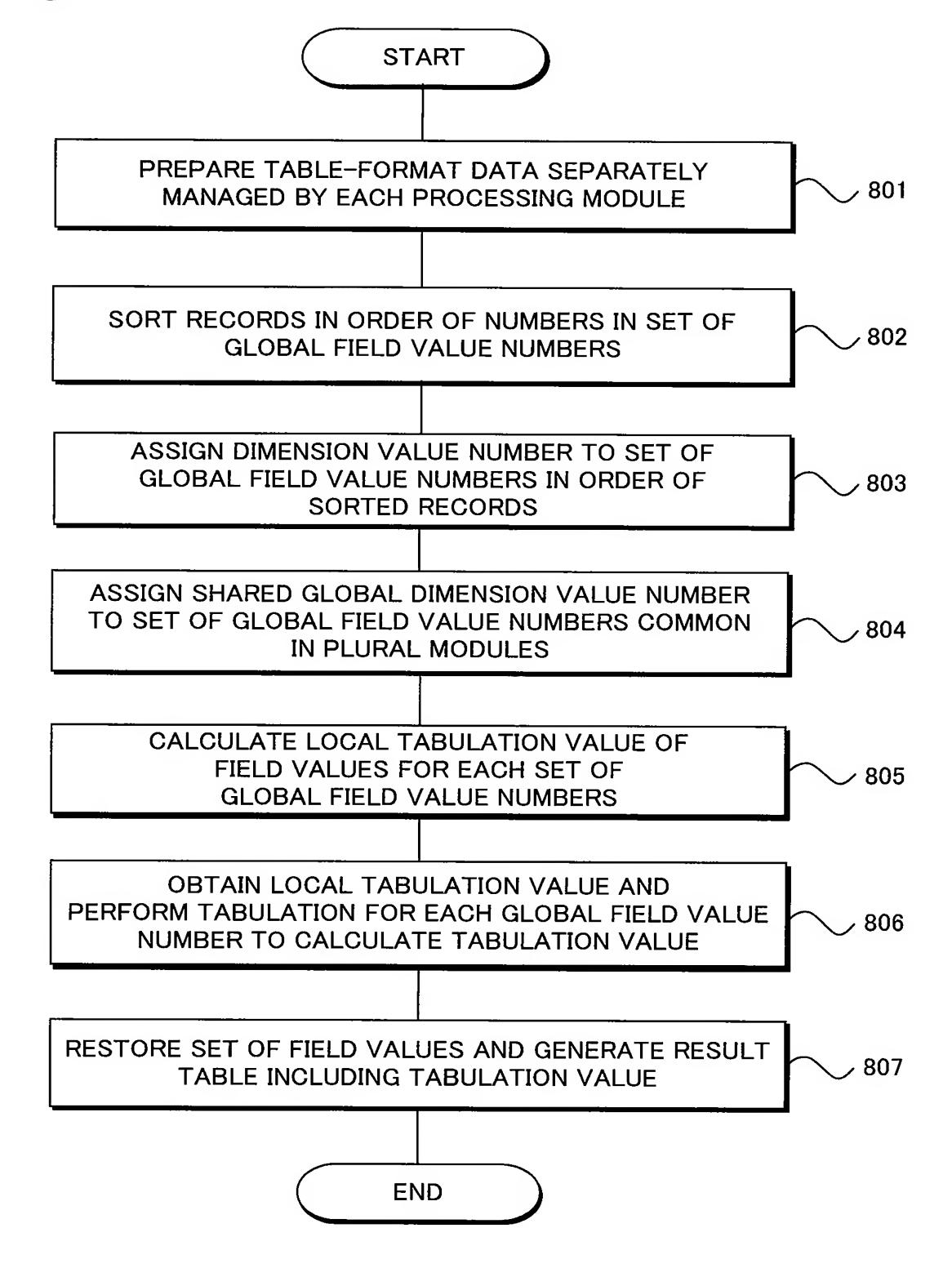
69 76 78 80 82 87 87 91

Fig.6

Fig.7

OFFSET= 0	
PMM-0	SEX (PMM-0) AGE (PMM-0) HEIGHT (PMM-0)
SEX AGE HEIGHT 1 MALE 1 82 2 FEMALE 2 69	GVNo VL GVNo VNo VL GVNo VNo VNo VL GVNo VNo VNo VL GVNo VNo VNO
OFFSET= 3	
PMM-1	SEX (PMM-1) AGE (PMM-1) HEIGHT (PMM-1)
SEX AGE HEIGHT 0 FEMALE 1 82 1 MALE 3 91	dSet VNo VL GVNo VN GVNO VL GVNO VNO VL GVNO VNO VL GVNO VNO VL GVNO VNO VL GVNO VNO VNO VNO VNO VNO VNO VNO VNO VNO
	ASCENDING ORDER ORDER ORDER ORDER ORDER ORDER ORDER
OFFSET= 5	
SEX AGE HEIGHT OFFMALE 1 76 FEMALE 1 78 FEMALE 2 84	OrdSet VNo VL GVNo VNO VNO<
OFFOFT- 8	ORDER I ORDER J
ı 	SEX (PMM-3) AGE (PMM-3) HEIGHT (PMM-3)
SEX AGE HEIGHT 0 MALE 3 87 1 FEMALE 3 80	7 Sing o
	ASCENDING ASCENDING ASCENDING ASCENDING ASCENDING ASCENDING ASCENDING ASCENDING ORDER ORDER

Fig.8



OrdSet OrdSet OrdSet Gord GOrd GOrd GOrd BY SEX BY SEX BY SEX BY SEX SORT SORT SORT SORT 0 0 0 0 2 OrdSet OrdSet OrdSet OrdSet 0.0 0 -GOrd GOrd GOrd GOrd **BY AGE** BY AGE SORT BY AGE BY AGE SORT SORT SORT 0 0 0 0 ASCENDING ASCENDING ASCENDING ASCENDING ORDER ORDER 0 2 ORDER ORDER 0 0 (PMM-0 AGE (PMM-1 ASCENDING ASCENDING (PMM AGE (PMM ASCENDING ASCENDING ORDER ORDER ORDER ORDER AGE AGE 0 0 0 **~** 0 + 0 0 0 -0:0 - 2 0 0 - 0 0 ASCENDING ORDER ASCENDING ASCENDING ASCENDING G ASCENDING GVNo GVNo ORDER ORDER ORDER 0 0 SEX (PMM-2) SEX (PMM-3) 1 FEMALE ASCENDING 0 FEMALE ASCENDING 0 MALE 1 FEMALE Щ Щ 0 MAL ASCENDING ORDER SEX (PMN 0 MAL **FEMAL** ╏ ORDER (PMI ORDER ORDER SEX VNo VNo VNo 000 0 + 0 0 0 - ~ 0 -0 0 -OrdSet OrdSet OrdSet OrdSet 0 -0 - 8 0 - 2 ASCENDING ASCENDING ASCENDING ASCENDING ORDER ORDER ORDER ORDER GOrd GOrd GOrd GOrd က 4 0 7 0 2 ထတ 2 0 0 0 HEIGHT HEIGHT HEIGHT HEIGHT 78 82 80 69 76 78 82 91 84 PMM-2 PMM-0 PMM-3 က PMM-AGE ျက က AGE AGE AGE 2 OFFSET= OFFSET= OFFSET= OFFSET= MALE FEMALE MALE FEMALE FEMALE FEMALE FEMALE FEMALE MALE SEX SEX Fig.9 0 2 0 0

OrdSet

0 0

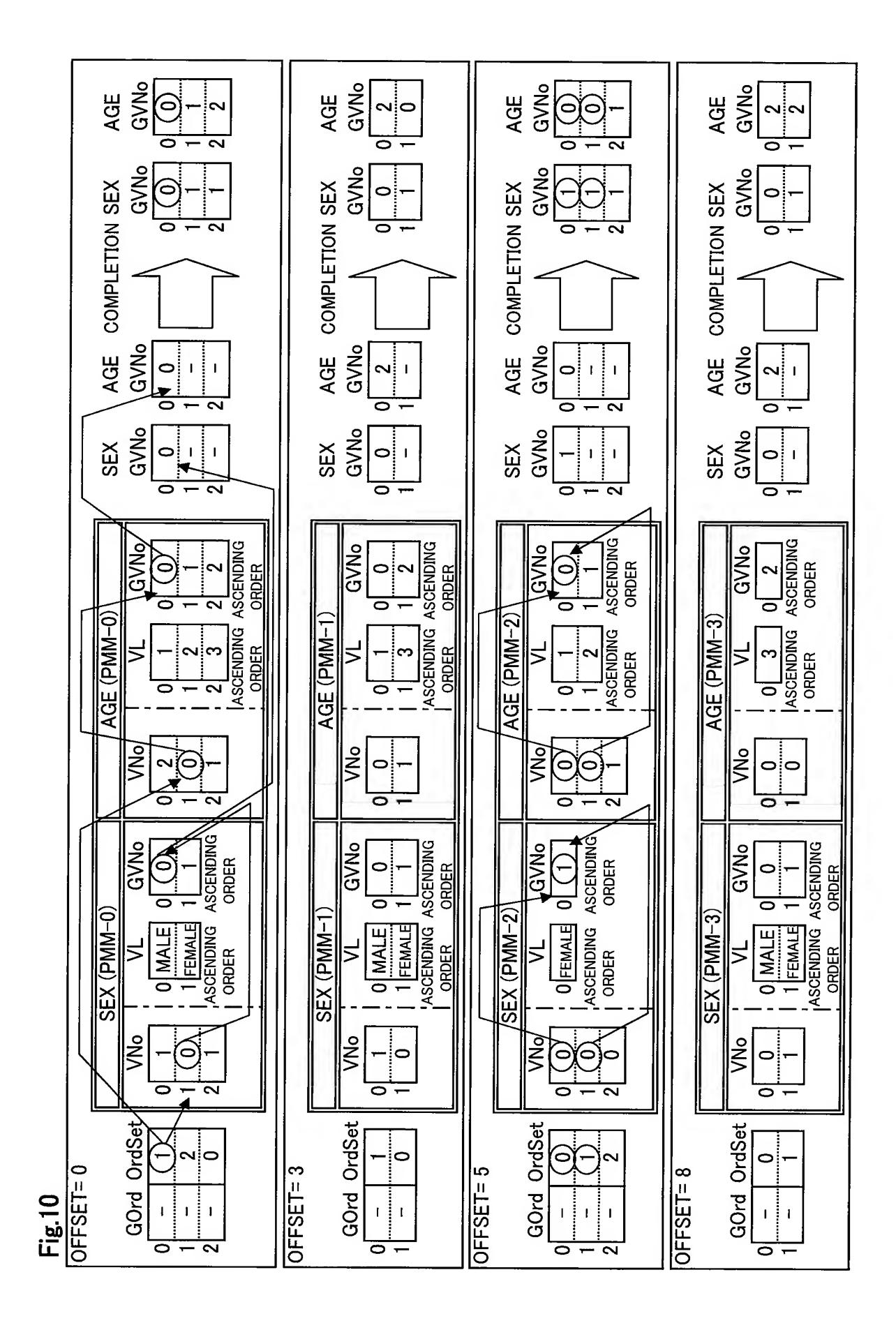
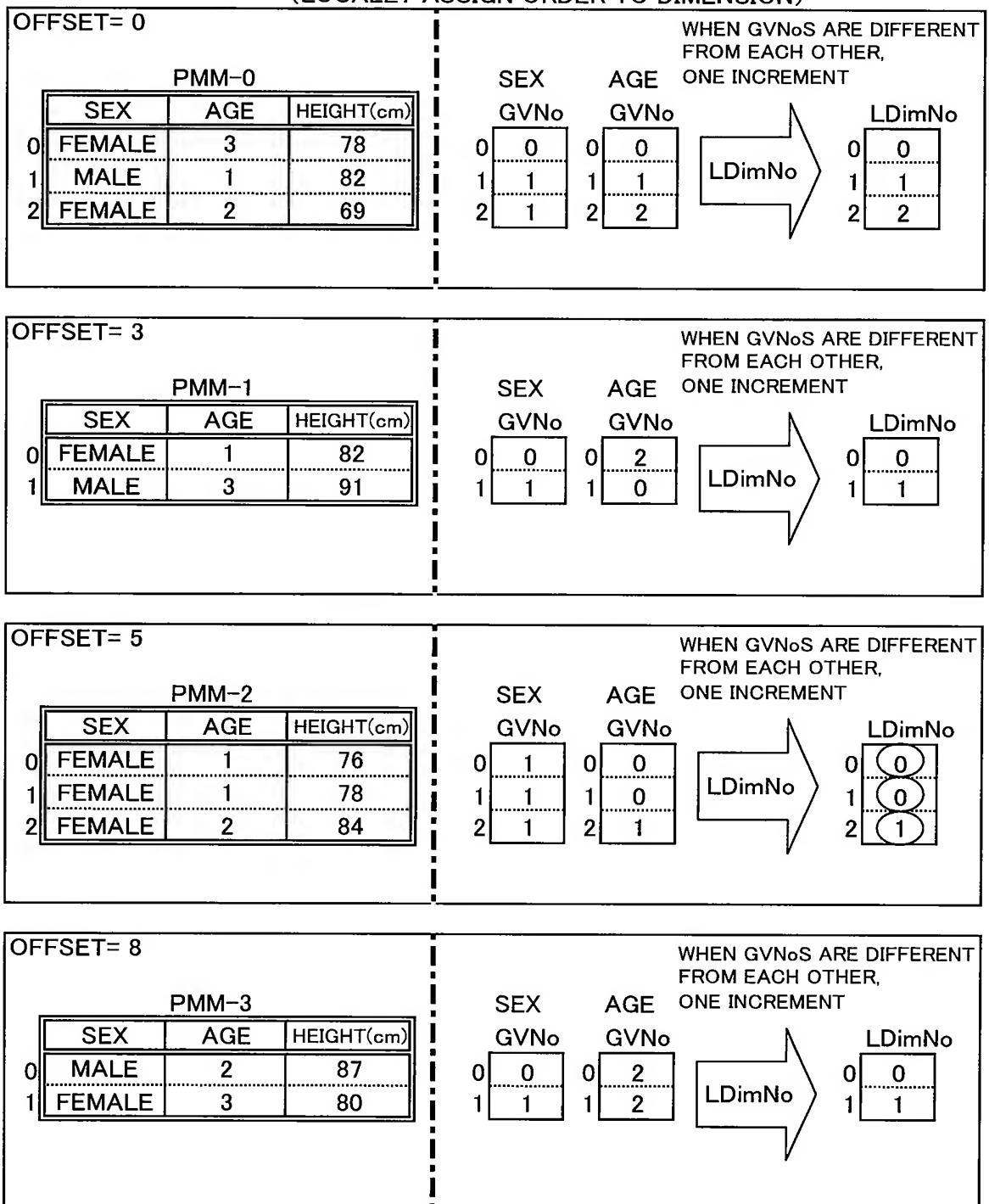


Fig.11

1

GENERATE LOCAL DIMENSION VALUE NUMBER LDimNo (LOCALLY ASSIGN ORDER TO DIMENSION)



GDimNo GDimNo GDimNo GDimNo 0->0 1->3 2->4 0->2 0->1 1->2 0->1 1->4 **UPDATE GDimNo** GVNo GVNo GVNo GVNo AGE AGE 0 - 2 2 AGE 00-AGE 0 LDimNo GVNo LDimNo GVNo LDimNo GVNo LDimNo GVNo SEX SEX SEX SEX 0 -0 00-0 0 0 0 GDimNo GDimPos GDimNo GDimPos GDimNo GDimPos GDimNo GDimPos 0 - 2 0 8 0 0 0 -**GDimNo GDimNo GDimNo GDimNo** 0 0 -DimNo LDimNo **LDimNo** LDimN 00-0-0-0 - 0 0 0 -0 - 2 0 GVNo GVNo GVNo GVNo AGE AGE AGE AGE 0 2 0 - 0 00-20 0 0 0 GVNo GVNo GVNo GVNo SEX SEX SEX SEX 10-0-0 12 0 0 0 2 HEIGHT 78 82 69 HEIGHT HEIGHT HEIGHT 76 78 84 87 PMM-0 PMM-2 PMM-3 က PMM-1 AGE AGE AGE [c] 2 FEMALE MALE FEMALE FEMALE FEMALE FEMALE FEMALE MALE SEX MALE FEMALE OFFSET= OFFSET= OFFSET= OFFSET= SEX SEX SE 0 0

Fig. 12

Fig.13

	LDimNo	GNo1	GNo2	GDimNo
	0	0	0	0
PMM-0	1	1	1	3
	2	1	2	4
PMM-1	0	0	2	1
	1	1	0	2
PMM-2	0	1	0	2
	1	1	1	3
PMM-3	0	0	2	1
	1	1	1	2

Fig.14

GMsr 1 0 2 0	GMsr 100	GMsr 100	GMsr 1 0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	GDimNo GDimPos LDimNo GVNo GVNo 1 2 1 1 1 1 1 1 1 1 1 1	GDimNo GDimPos LDimNo GVNo GVNo 1 3 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 2 2 2 2 2 2 2 2	GDimNo GDimPos LDimNo GVNo GVNo 1 1 1 1 1 1 1 1 1 1
OFFSET= 0	OFFSET= 3 PMM-1 SEX AGE HEIGHT OFFMALE 1 82 1 MALE 3 91	PMM-2 SEX AGE HEIGHT 0 FEMALE 1 76 1 FEMALE 1 78 2 MALE 2 84	OFFSET= 8 PMM-3 OMALE 2 87 1 FEMALE 3 80

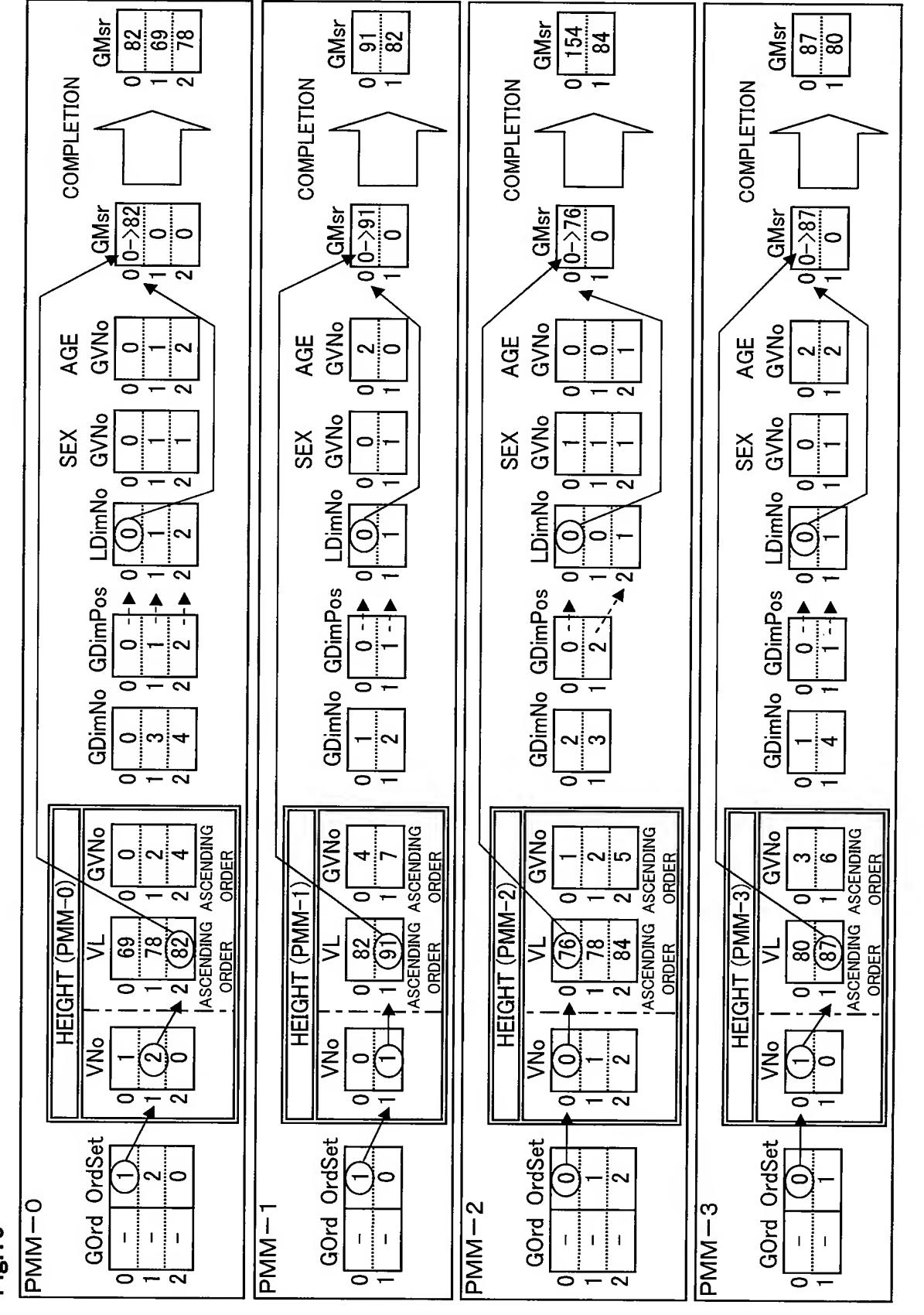
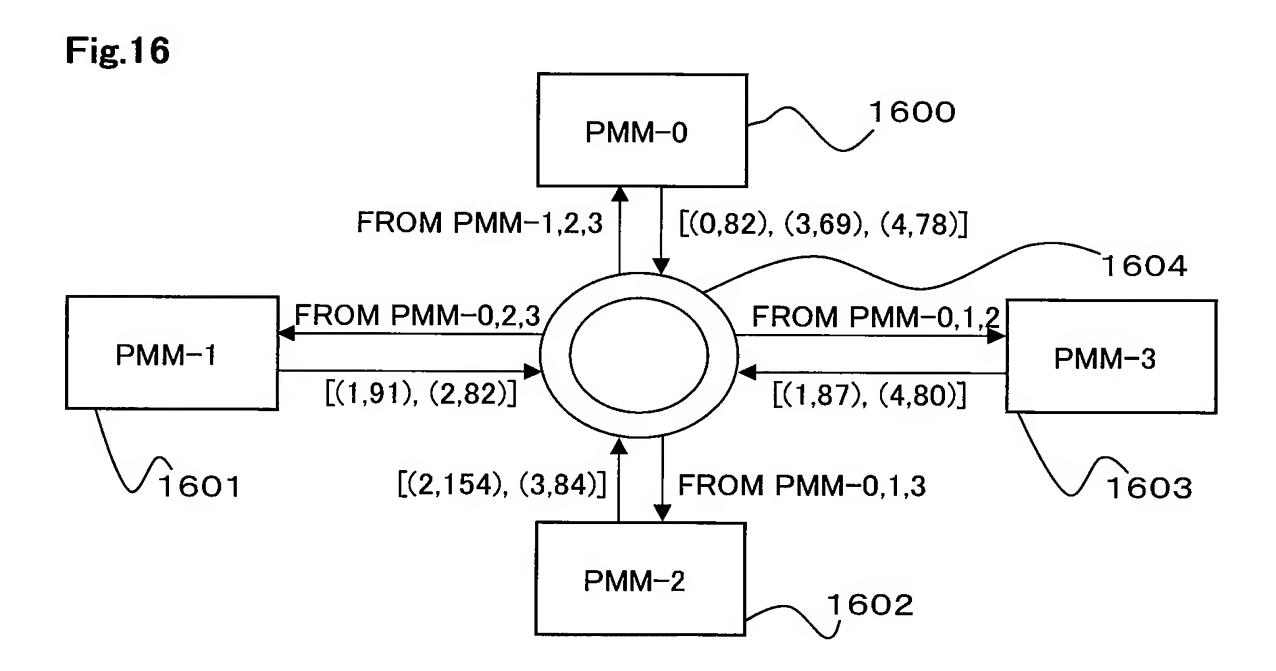


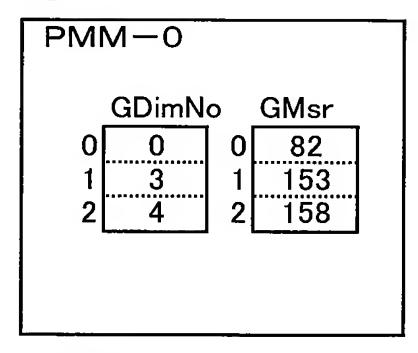
Fig.15

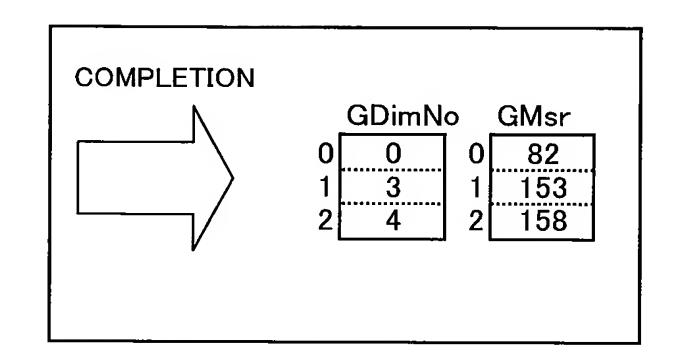


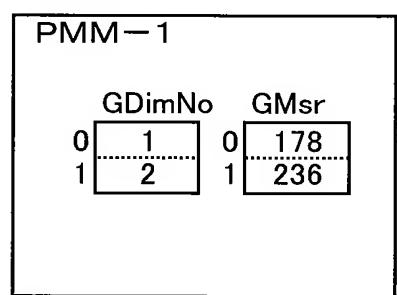
GMsr GMsr GMsr GMsr 178 158 **GDimNo GDimNo GDimNo GDimNo** O W 4 0 0 0 COMPLETION COMPLETION COMPLETION COMPLETION GMsr GMsr GMsr GMsr 80 87 PMM-3 PMM-3 PMM-3 PMM-2 **GDimNo GDimNo GDimNo GDimNo** GMsr GMsr GMsr GMsr PMM-2 PMM-2 PMM-1 PMM-1 GDimNo GDimNo DimNo GDimNo GMsr GMsr GMsr GMsr 78 PMM-0 PMM-0 PMM-1 PMM-0 **GDimNo GDimNo GDimNo GDimNo** 82 69 78 91 82 GMsr GMsr GMsr GMsr 154 84 87 2 - 0 0 -**GDimNo** 0 0 **GDimNo GDimNo GDimNo** PMM-0 PMM-2 PMM-3 O & 4 PMM-1 ام ^{اه}ا. 0 0

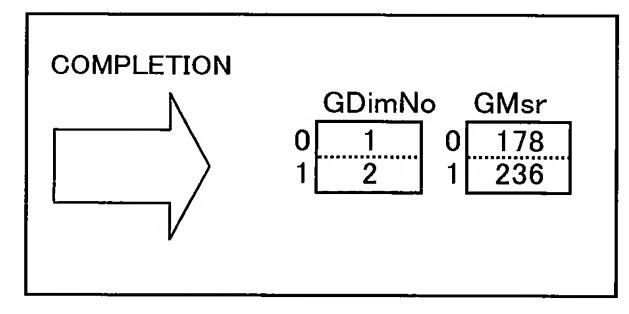
Fig.17

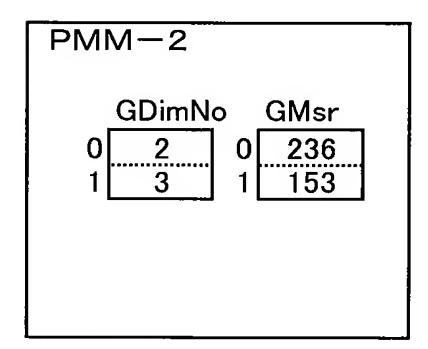
Fig.18

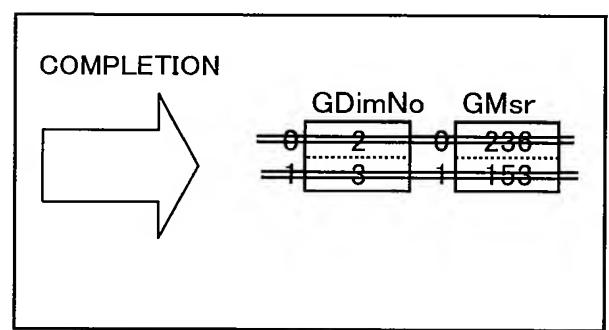


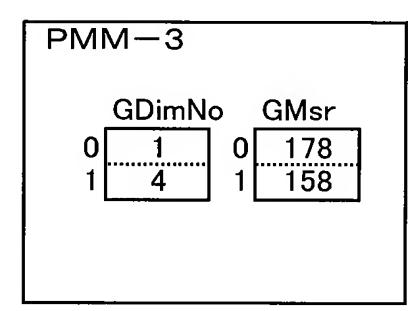


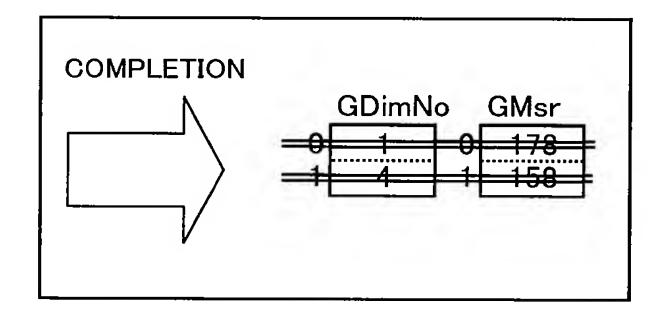








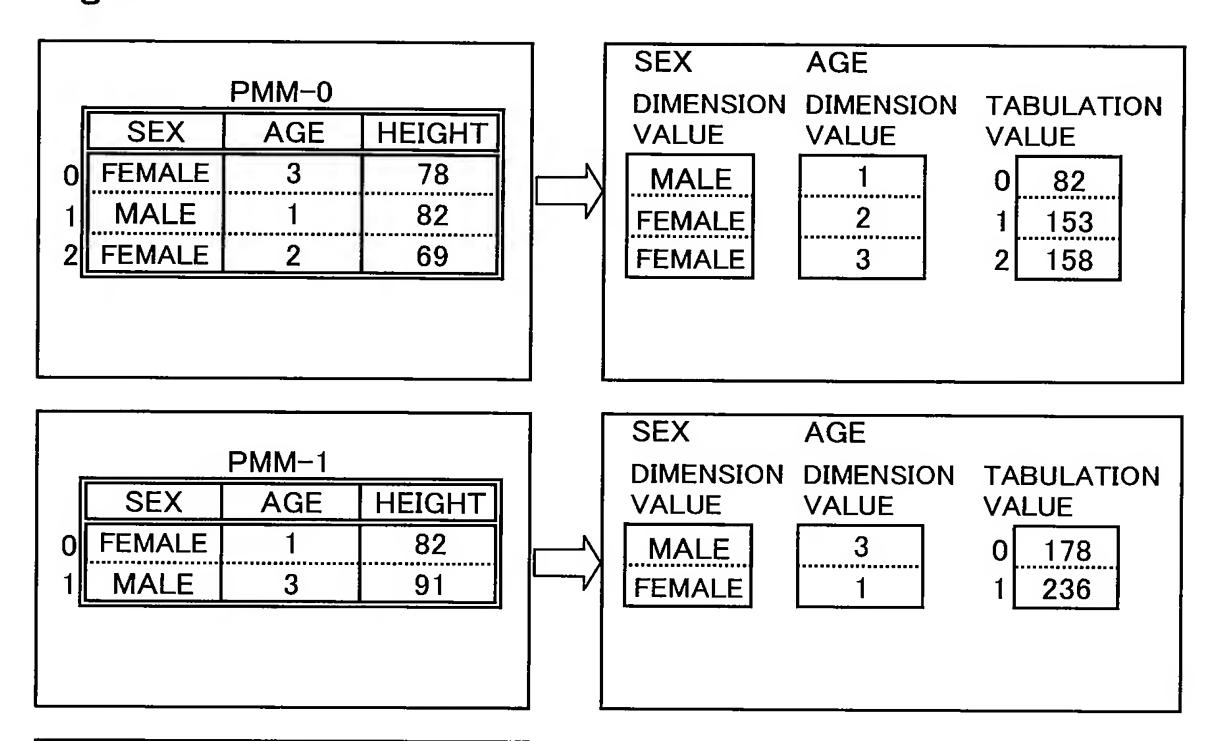




1 2 ASCENDING ORDER GVNo ASCENDING ORDER 0 2 ASCENDING ASCENDING ORDER AGE ORDER AGE 0 VNo 0 -0 0 -ASCENDING ORDER ASCENDING ORDER 0 1 FEMALE ASCENDING ORDER FEMALE MALE MALE ASCENDING ORDER SEX SEX 0 + -0 1 0 -GVNo GVNo AGE AGE 0 0 2 GVN₀ GVNo SEX SEX 0 -LDimNo LDimNo 0 **GDimPos GDimPos** GMsr **GDimNo GDimNo** PMM-0 0 8 4 PMMI-1 0

Fig.19

Fig.20



		PMM-2	
	SEX	AGE	HEIGHT
0	FEMALE	1	76
1	FEMALE	1	78
2	FEMALE	2	84
			

		PMM-3	
	SEX	AGE	HEIGHT
0	MALE	3	87
1	FEMALE	3	80
Ľ			

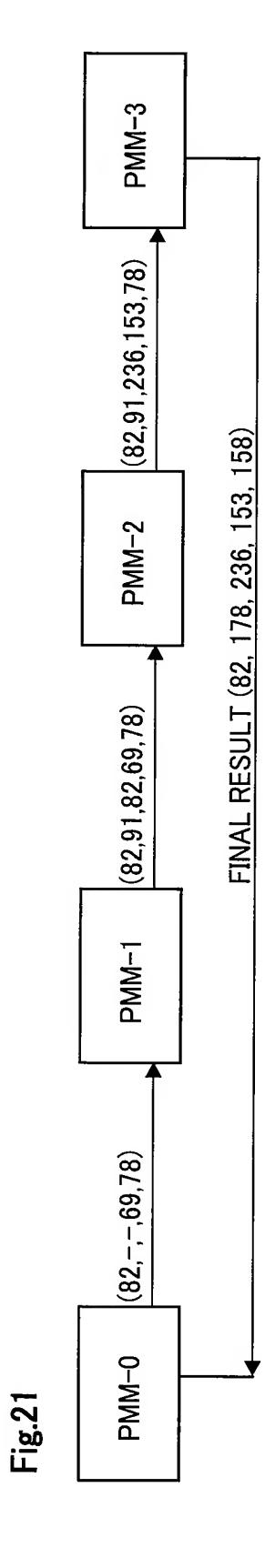
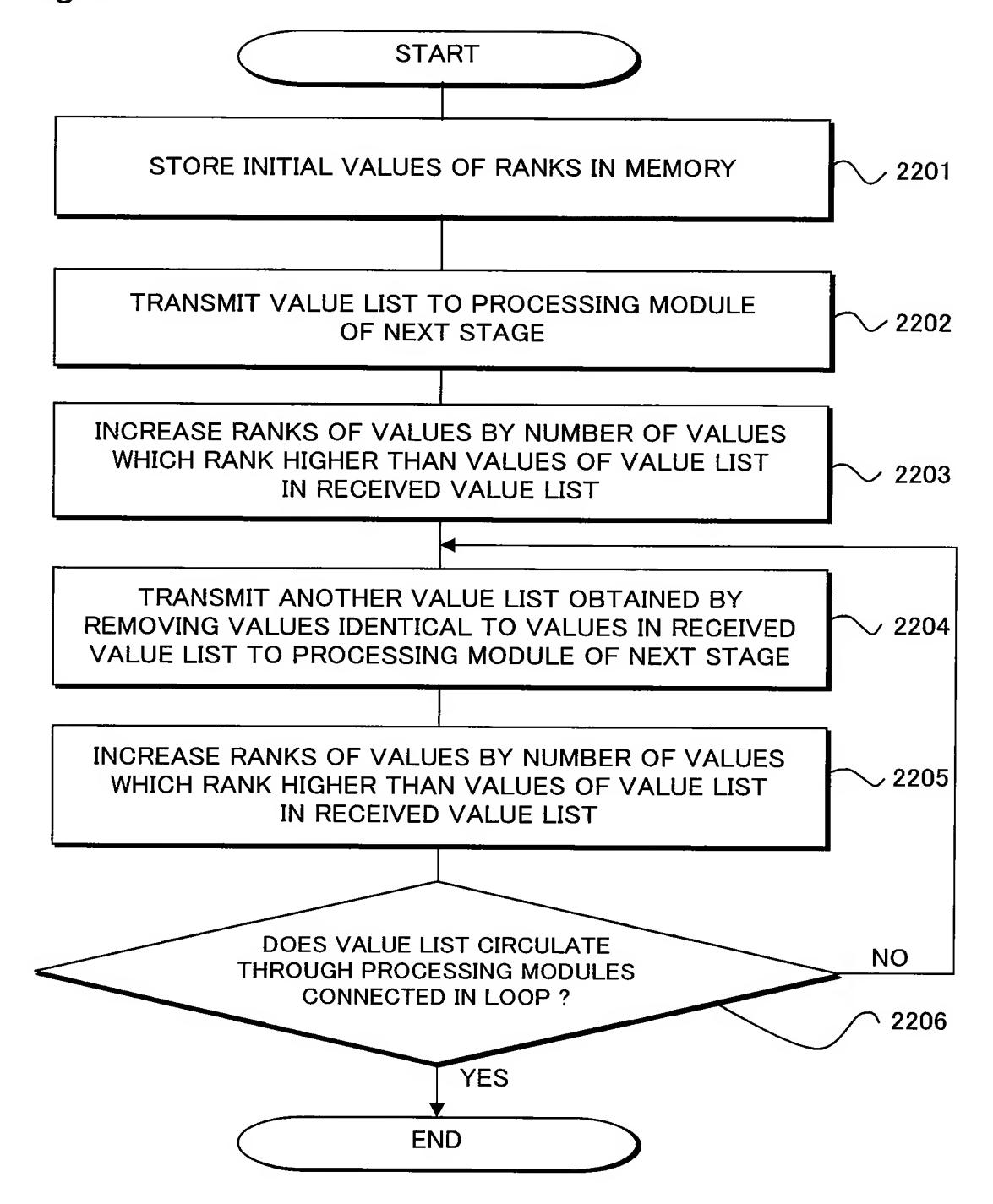
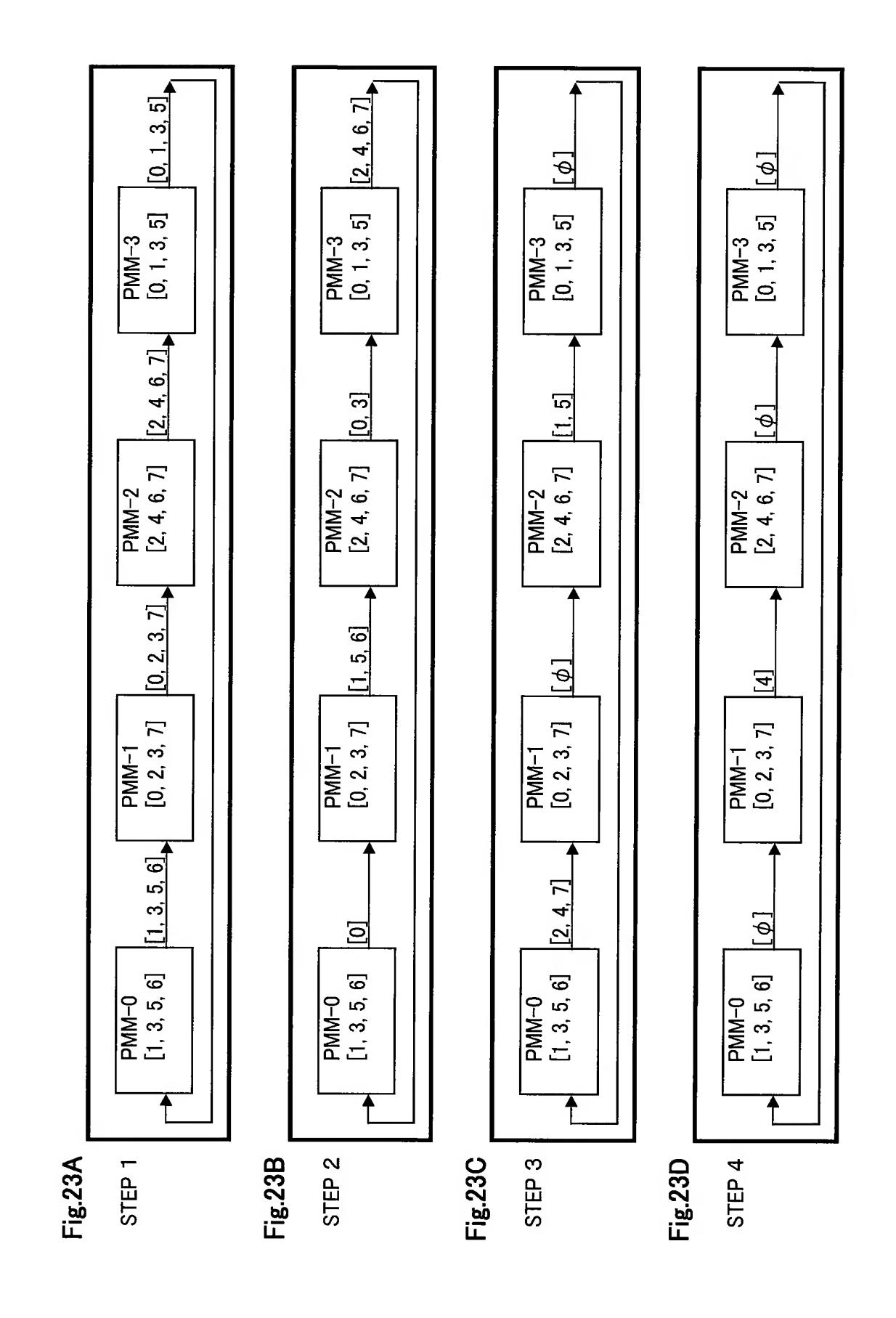


Fig.22





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L	_	

Fig.24A				
	RECEPTION LIST			
	PMM-0	PMM-1	PMM-2	PMM-3
STEP 1	[0, 1, 3, 5]	[1, 3, 5, 6]	[0, 2, 3, 7]	[2, 4, 6, 7]
Fig.24B				
)	RECEPTION LIST			
	PMM-0	PMM-1	PMM-2	PMM-3
STEP 2	[0, 1, 3, 5]	[1, 3, 5, 6]	[0, 2, 3, 7]	[2, 4, 6, 7]
	[2, 4, 6, 7]	[0]	[1, 5, 6]	[0, 3]
Fig.24C				
	DECEDITION LIST			

	RECEPTION LIST			
	PMM-0	PMM-1	PMM-2	PMM-3
STEP 3	[0, 1, 3, 5]	[1, 3, 5, 6]	-	[2, 4, 6, 7]
	[2, 4, 6, 7]	[0]	[1, 5, 6]	
	$[\phi]$	[2, 4, 7]		[1, 5]

Fig.24D

	RECEPTION LIST			
	PMM-0	PMM-1	PMM-2	PMM-3
STEP 4	[0, 1, 3, 5]	[1, 3, 5, 6]		[2, 4, 6, 7]
	6	[0]	[1, 5, 6]	3
	$[\phi]$	[2, 4, 7]	$[\phi]$	[1, 5]
	$[\phi]$	$[\phi]$	[4]	$[\phi]$

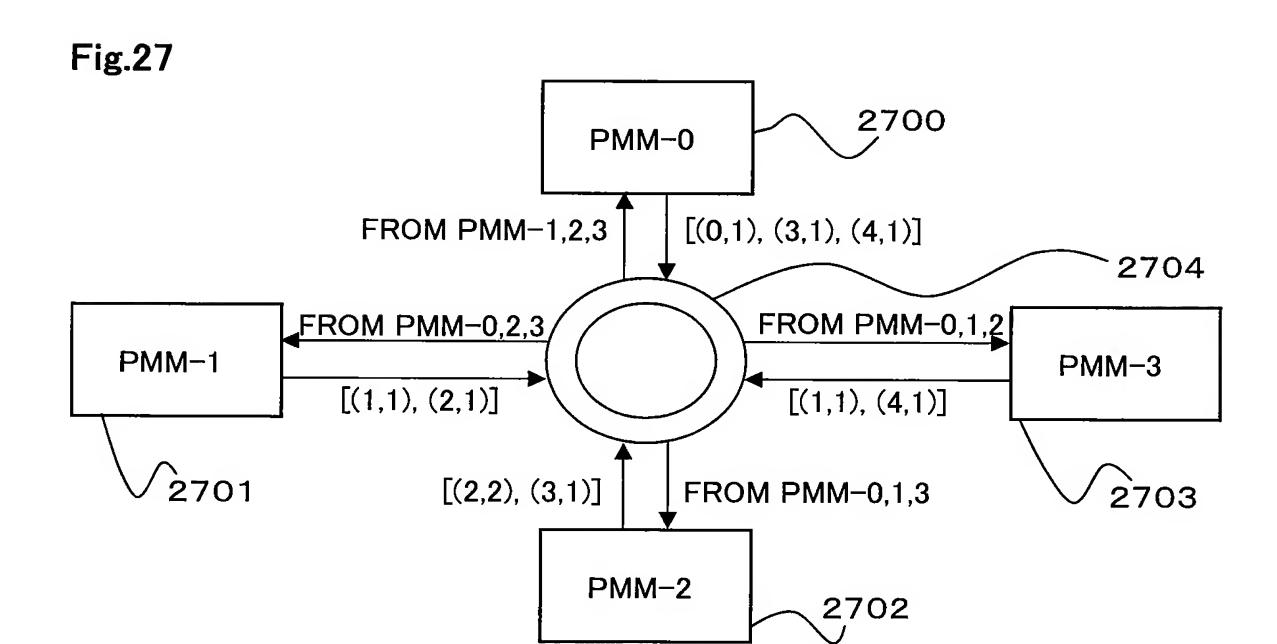
Fig.25

GMsr 1 0 2 0	GMsr 100	GMsr 1 0	GMsr 1 0
GDimNo GDimPos LDimNo GVNo GVNo GVNo GVNo GVNo GVNo GVNo GV	GDimNo GDimPos LDimNo GVNo GVNo $\frac{1}{2}$ 1 1 1 1 1 1 1 1 1 1	GDimNo GDimPos LDimNo GVNo GVNo GVNo $\frac{2}{3}$ 1 $\frac{2}{2}$ $\frac{1}{2}$	GDimNo GDimPos LDimNo GVNo GVNo GVNo $\frac{1}{4}$ 1 $\frac{0}{1}$ 0 0 0 0 0 0 0 0 0 0
OFFSET= 0	OFFSET= 3 PMM-1 0 FEMALE 1 82 0 1 MALE 3 91 1	OFFSET= 5	OFFSET= 8

GMsr GMsr GMsr GMsr COMPLETION COMPLETION COMPLETION COMPLETION GMsr GMsr GMsr GMsr 0 -GVNo GVNo GVNo GVNo AGE AGE AGE AGE 00 0 0 1 2 - 0 0 GVNo GVNo GVNo GVNo SEX SEX SEX SEX 0 0 0 0 **LDimNo LDimNo LDimNo** GDimPos

0 --GDimPos 0 --**♦ GDimPos GDimPos** 2 ... 0 -0 **GDimNo GDimNo GDimNo GDimNo** 2 8 0 & 4 OrdSet GOrd OrdSet GOrd OrdSet GOrd OrdSet \bigcirc PMM-0 PMM-2 PMM-3 PMM-1 GOrd 0 -0 1

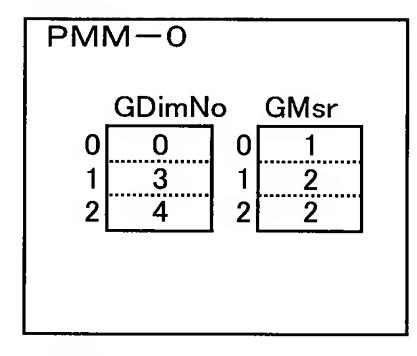
Fig.26

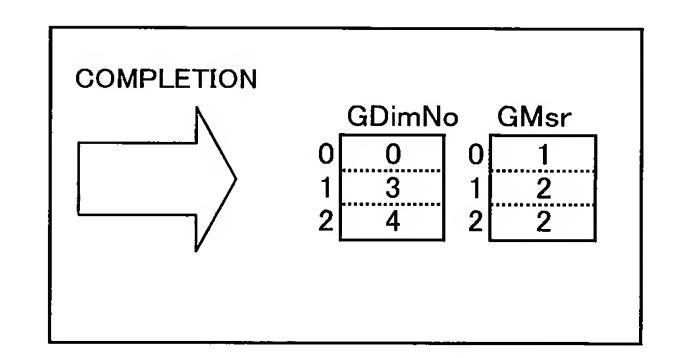


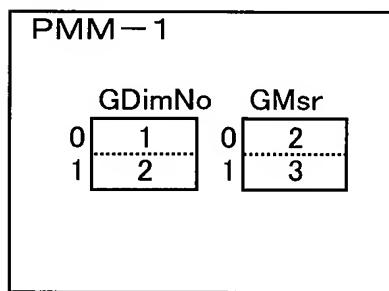
GMsr GMsr GMsr GMsr **GDimNo GDimNo GDimNo GDimNo** O & 4 0 0 COMPLETION COMPLETION COMPLETION COMPLETION GMsr GMsr GMsr PMM-3 PMM-3 PMM-3 PMM-2 **GDimNo GDimNo GDimNo GDimNo** GMsr GMsr GMsr GMsr PMM-2 PMM-2 PMM-1 PMM-1 GDimNo 1 3 1 GDimNo **GDimNo** 2 GMsr GMsr GMsr GMsr PMM-0 PMM-0 PMM-0 PMM-1 **GDimNo GDimNo GDimNo GDimNo** 91 GMsr GMsr GMsr 82 78 78 GMsr 87 7 0 + **GDimNo GDimNo** 0 0 **GDimNo GDimNo** PMM-0 PMM-2 PMM-3 PMM-1 ·1-[2] O w 4 3 8 0 0

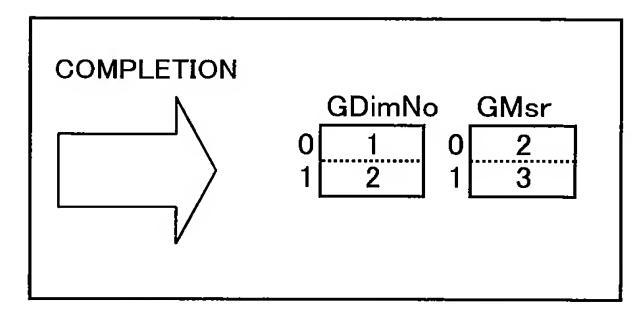
Fig.28

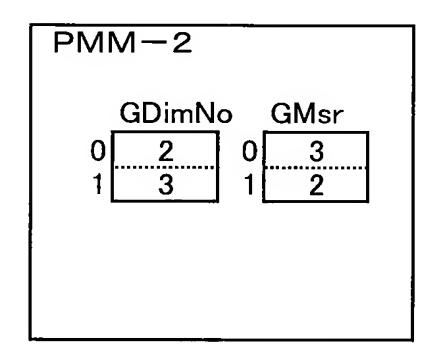
Fig.29

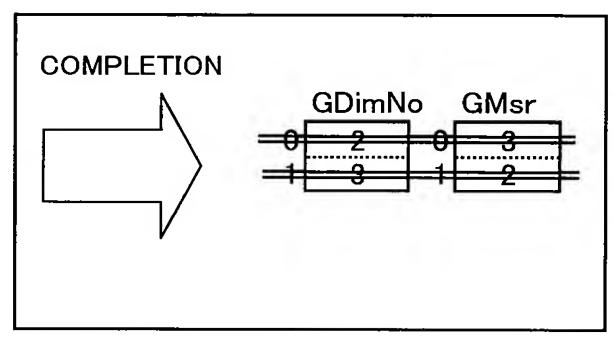


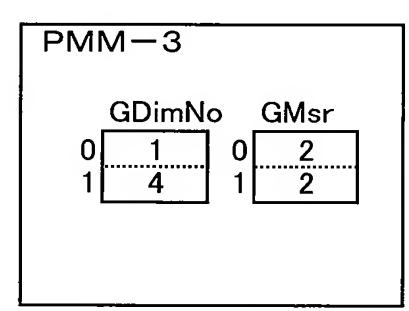


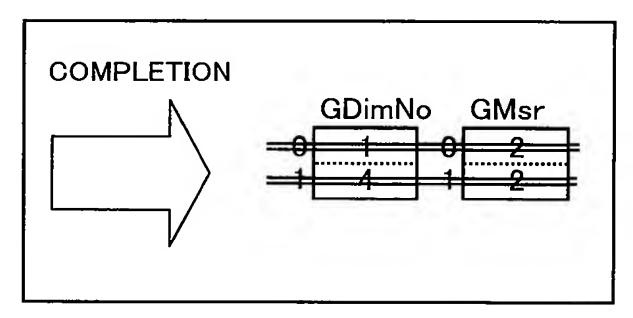








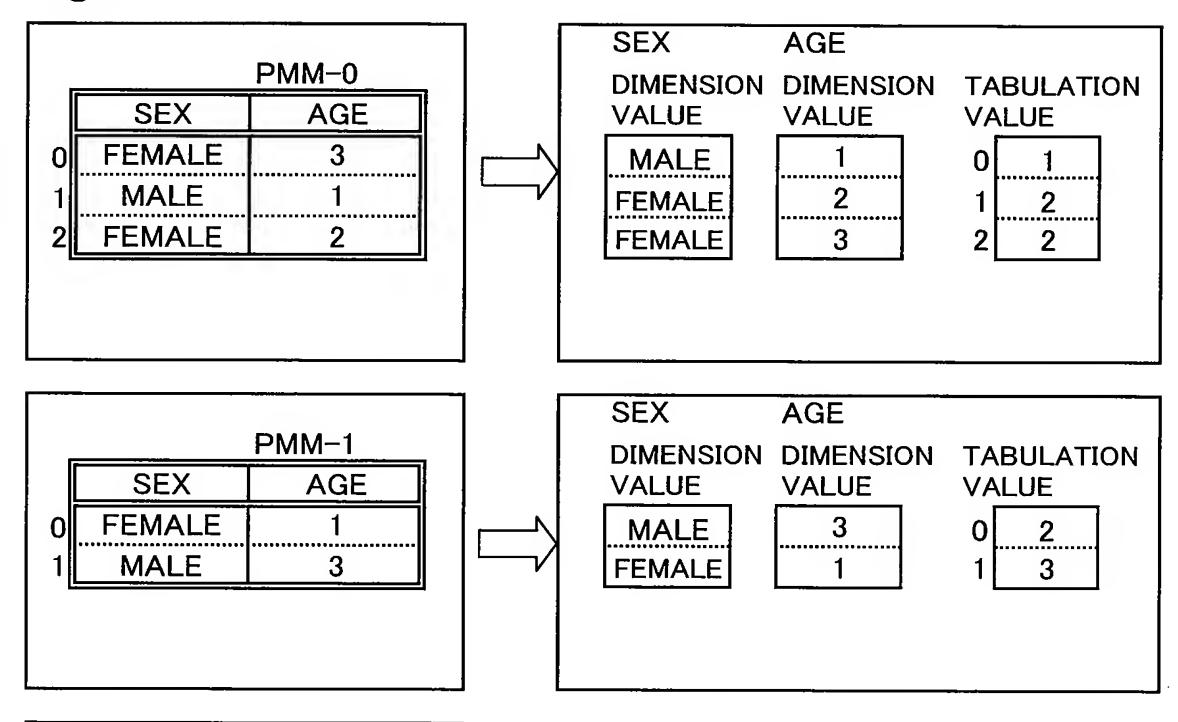




1 2 ASCENDING ORDER ASCENDING ORDER 1 3 ASCENDING ORDER ASCENDING ORDER AGE AGE 0 -0 ASCENDING ORDER ASCENDING ORDER 0 0 0 1 FEMALE ASCENDING ORDER MALE ASCENDING ORDER FEMALE MALE VNo 0 -0 0 GVNo GVNo AGE AGE 0 2 0 2 GVN₀ GVNo SEX SEX 0 LDimNo -DimNo **GDimPos GDimPos** GDimNo GMsr **GDimNo** PMM-0 PMM-1

Fig.30

Fig.31



_		PMM-2	•
	SEX	AGE	
0	FEMALE	1	
1	FEMALE	1	
2	FEMALE	2	

-		PMM-3	-
	SEX	AGE	
0	MALE	3	
1	FEMALE	3	

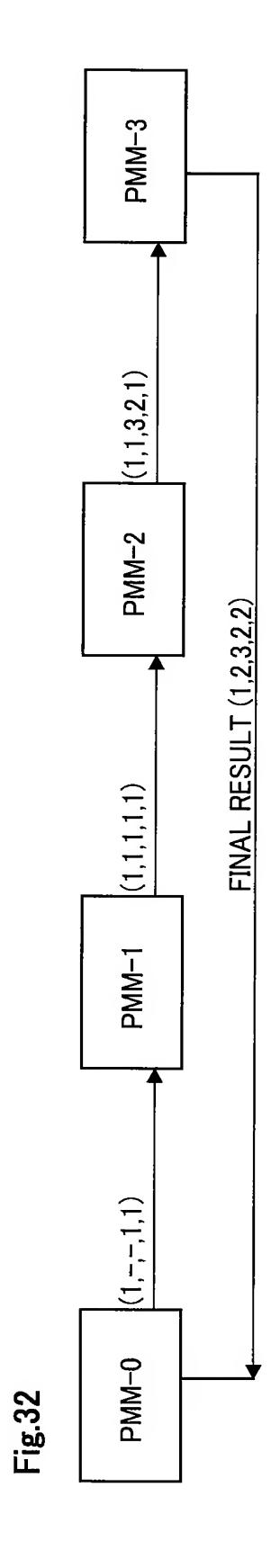
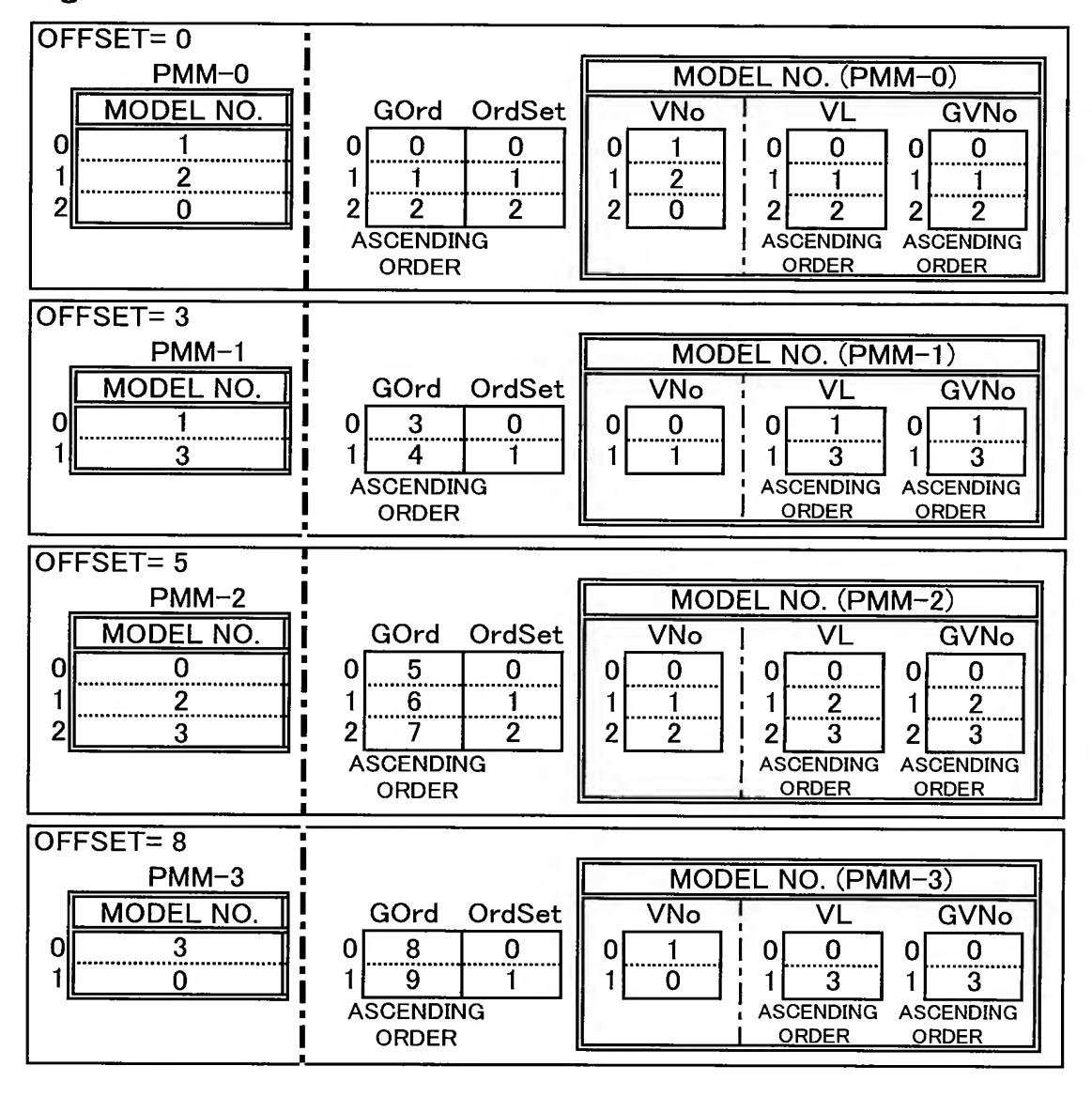
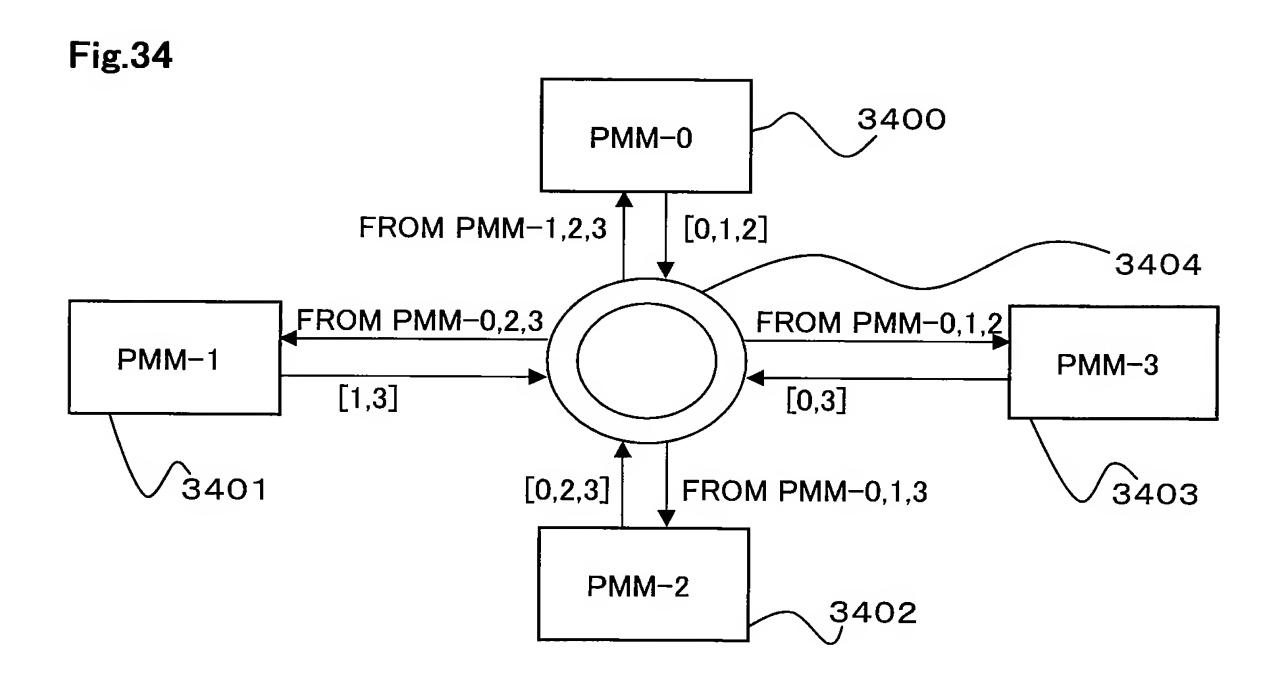


Fig.33





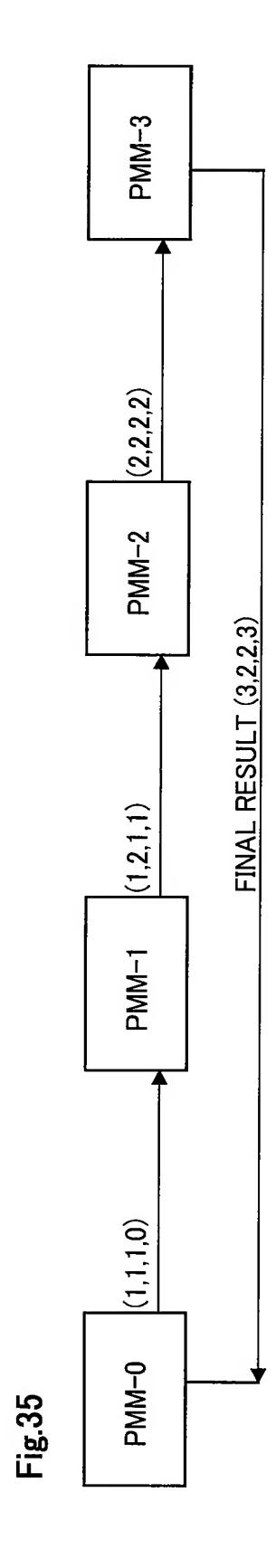


Fig.36

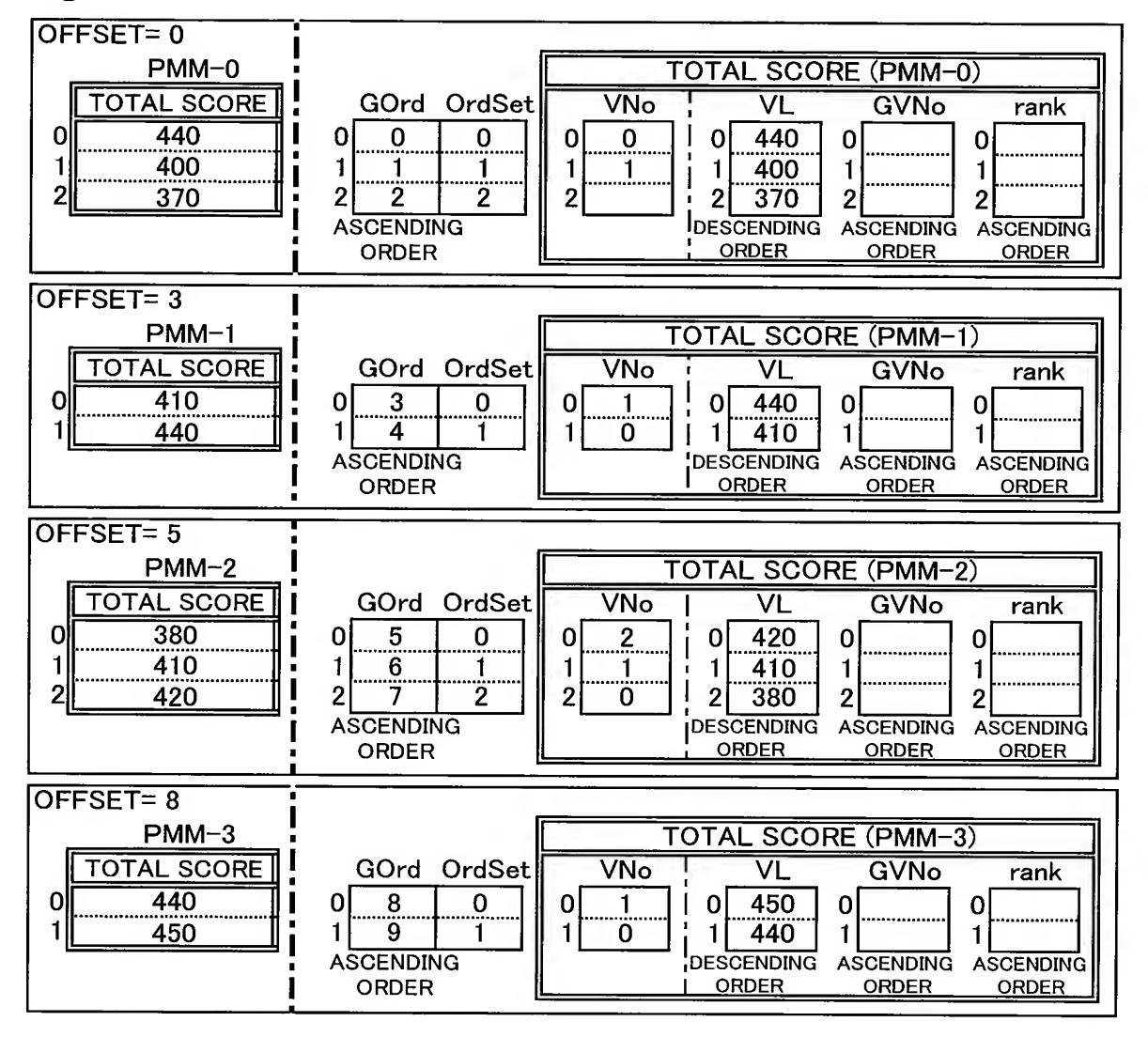


Fig.37A

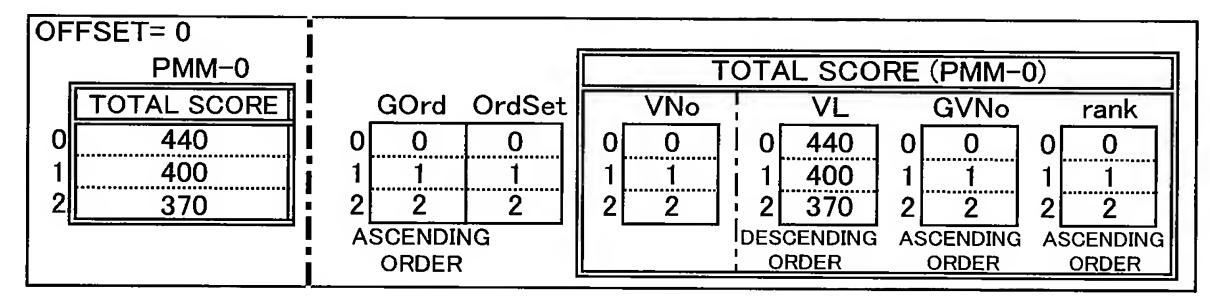


Fig.37B

RECEIVE 410 AND 440 FROM PMM-1

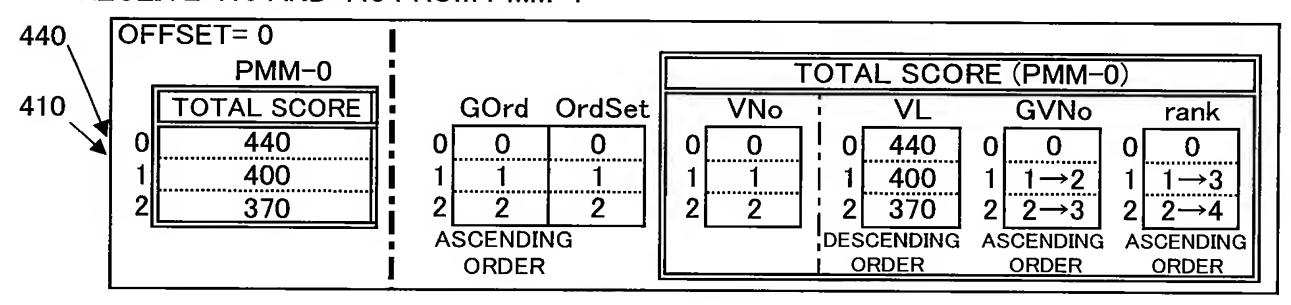


Fig.37C

RECEIVE 380, 410 AND 420 FROM PMM-2

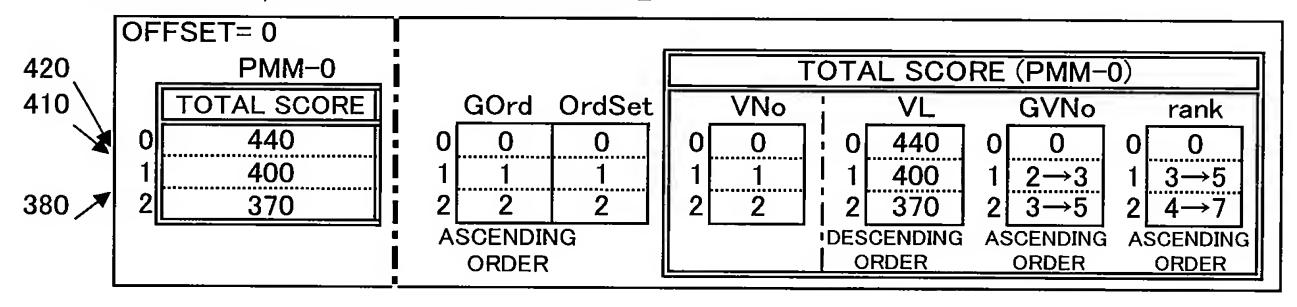


Fig.37D

RECEIVE 440 AND 450 FROM PMM-3

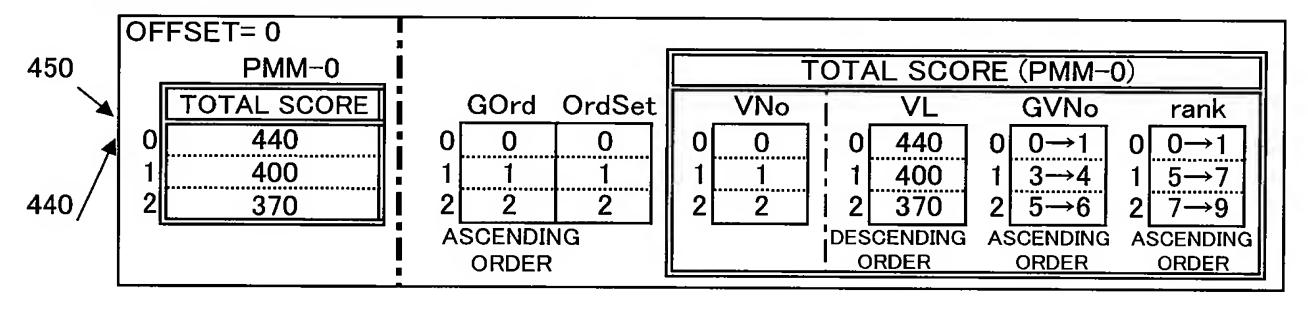


Fig.38

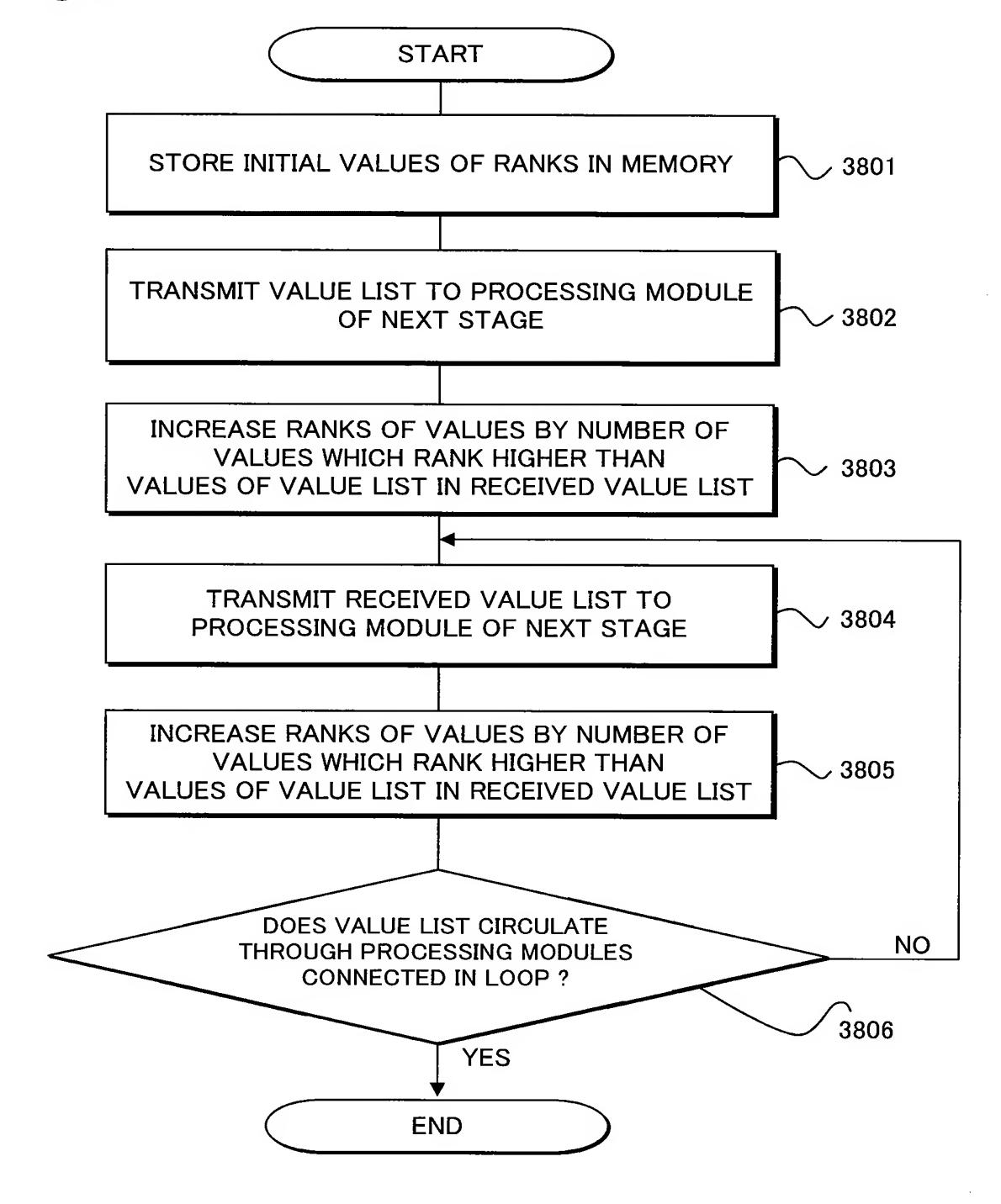


Fig.39A

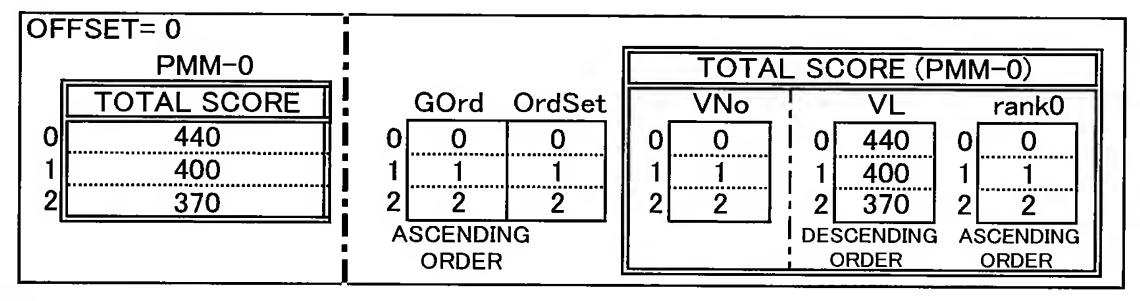


Fig.39B

RECEIVE 410 AND 440 FROM PMM-1

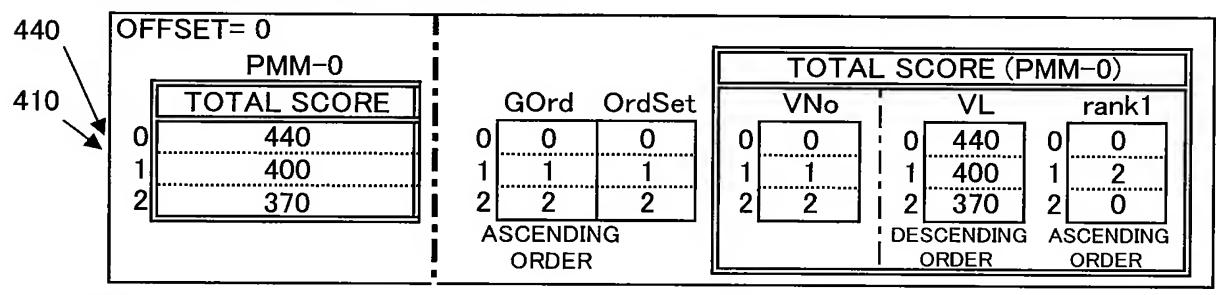


Fig.39C

RECEIVE 380, 410 AND 420 FROM PMM-2

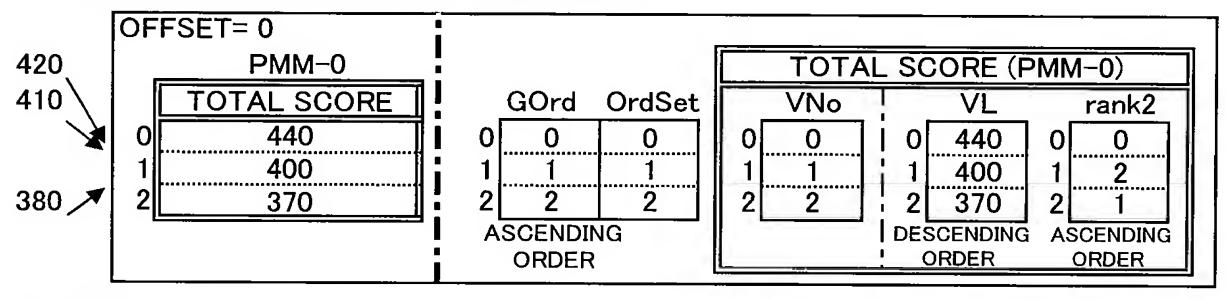


Fig.39D

RECEIVE 440 AND 450 FROM PMM-3

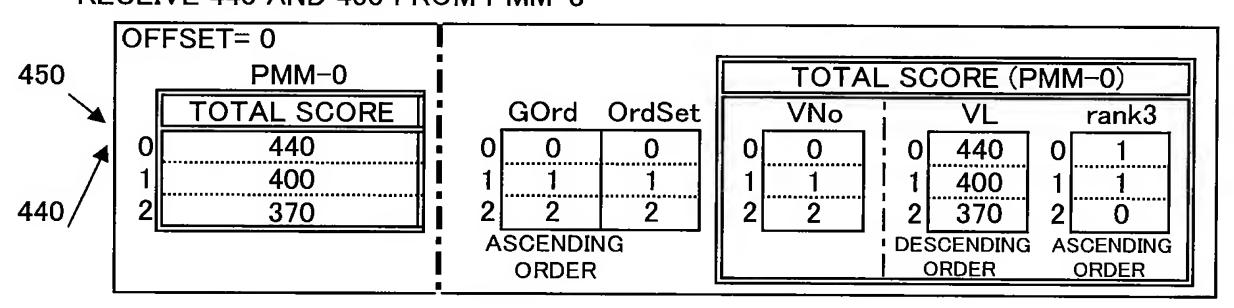


Fig.39E

Fig.40

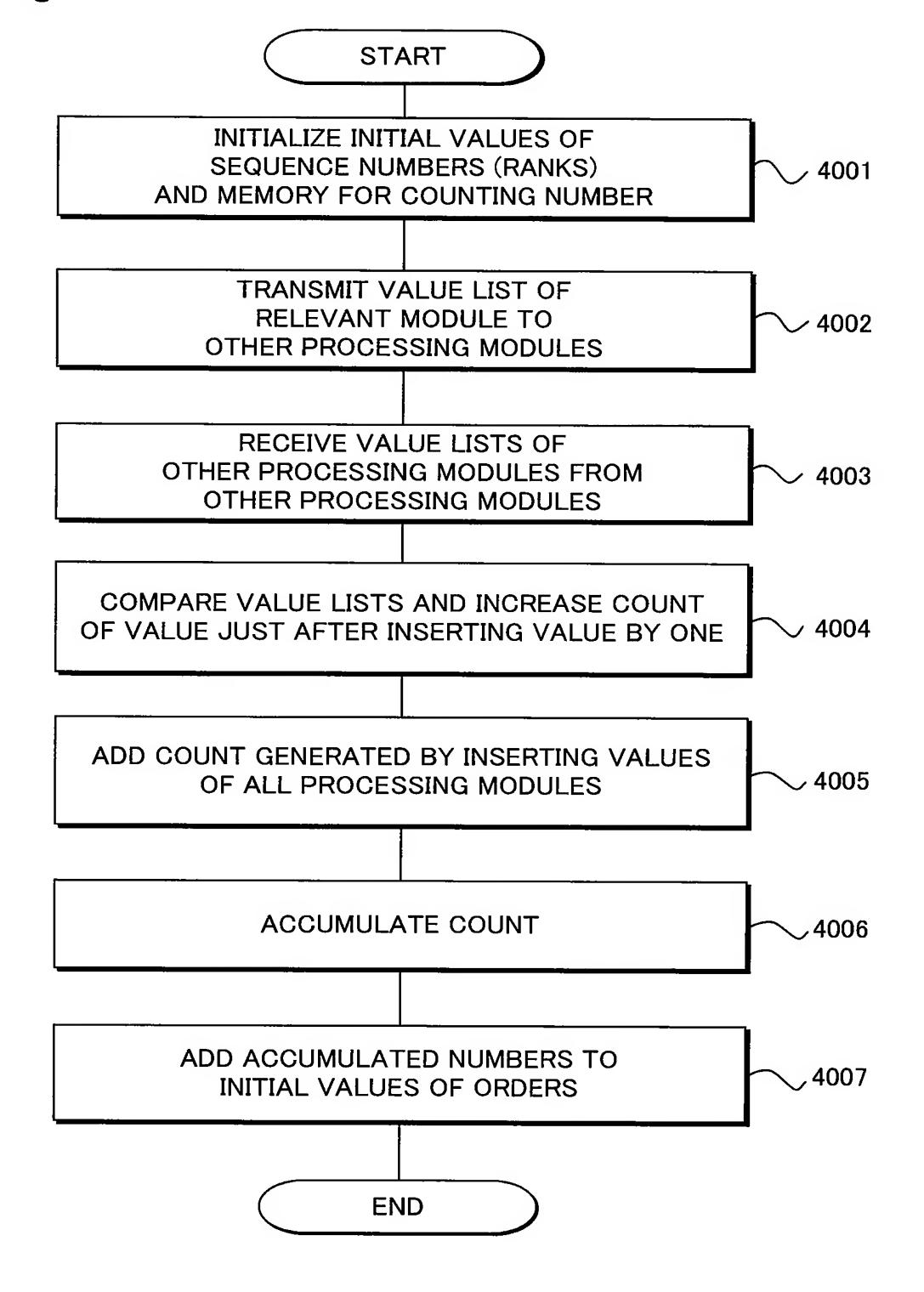


Fig.41A

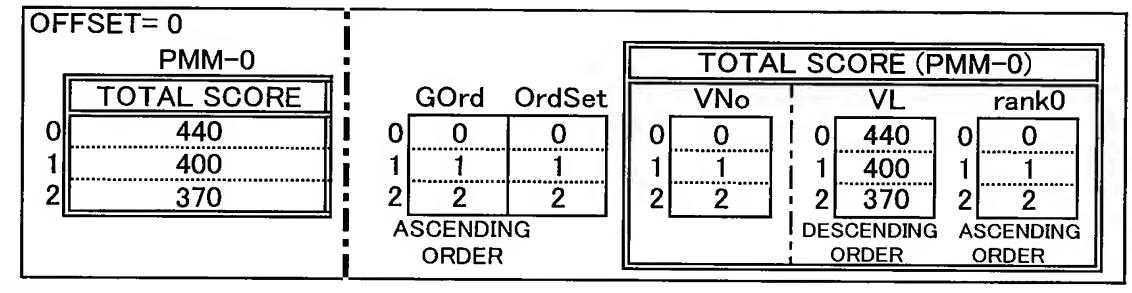


Fig.41B

RECEIVE [(410,1),(440,1)] FROM PMM-1

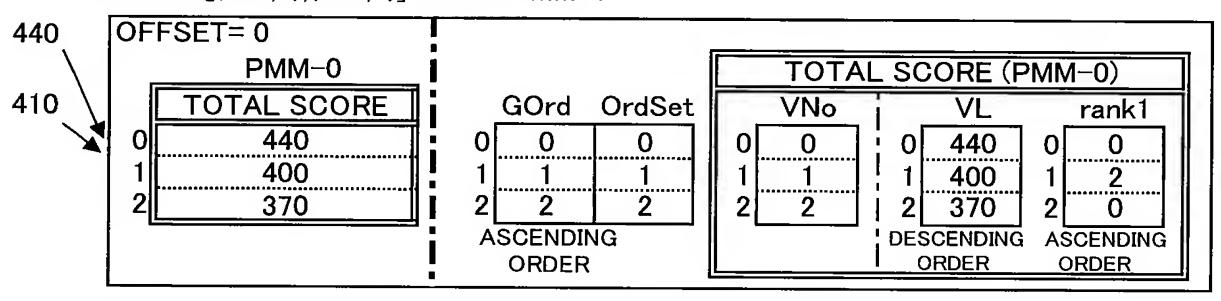


Fig.41C

RECEIVE [(380,1),(420,2)] FROM PMM-2

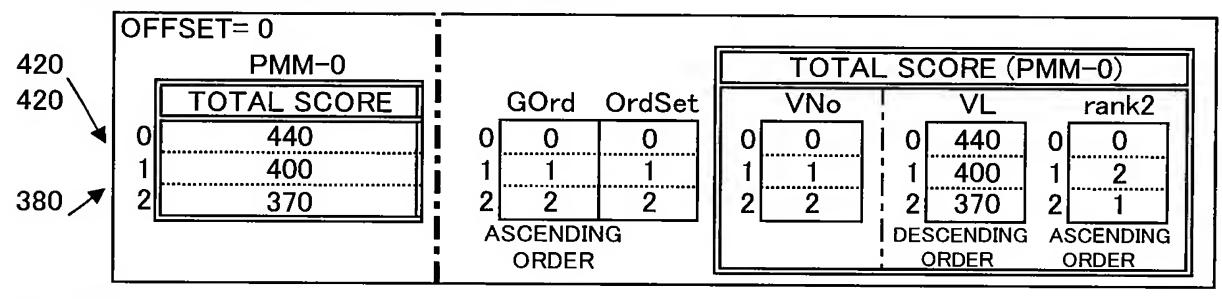


Fig.41D

RECEIVE 440 AND 450 FROM PMM-3

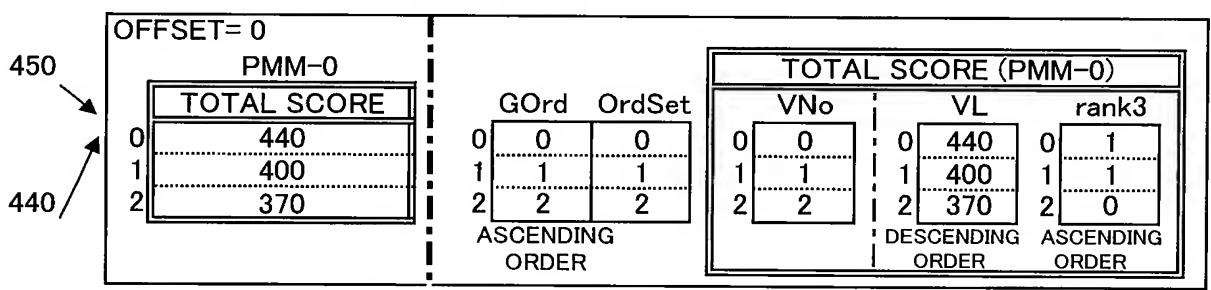


Fig.41E

Fig.42

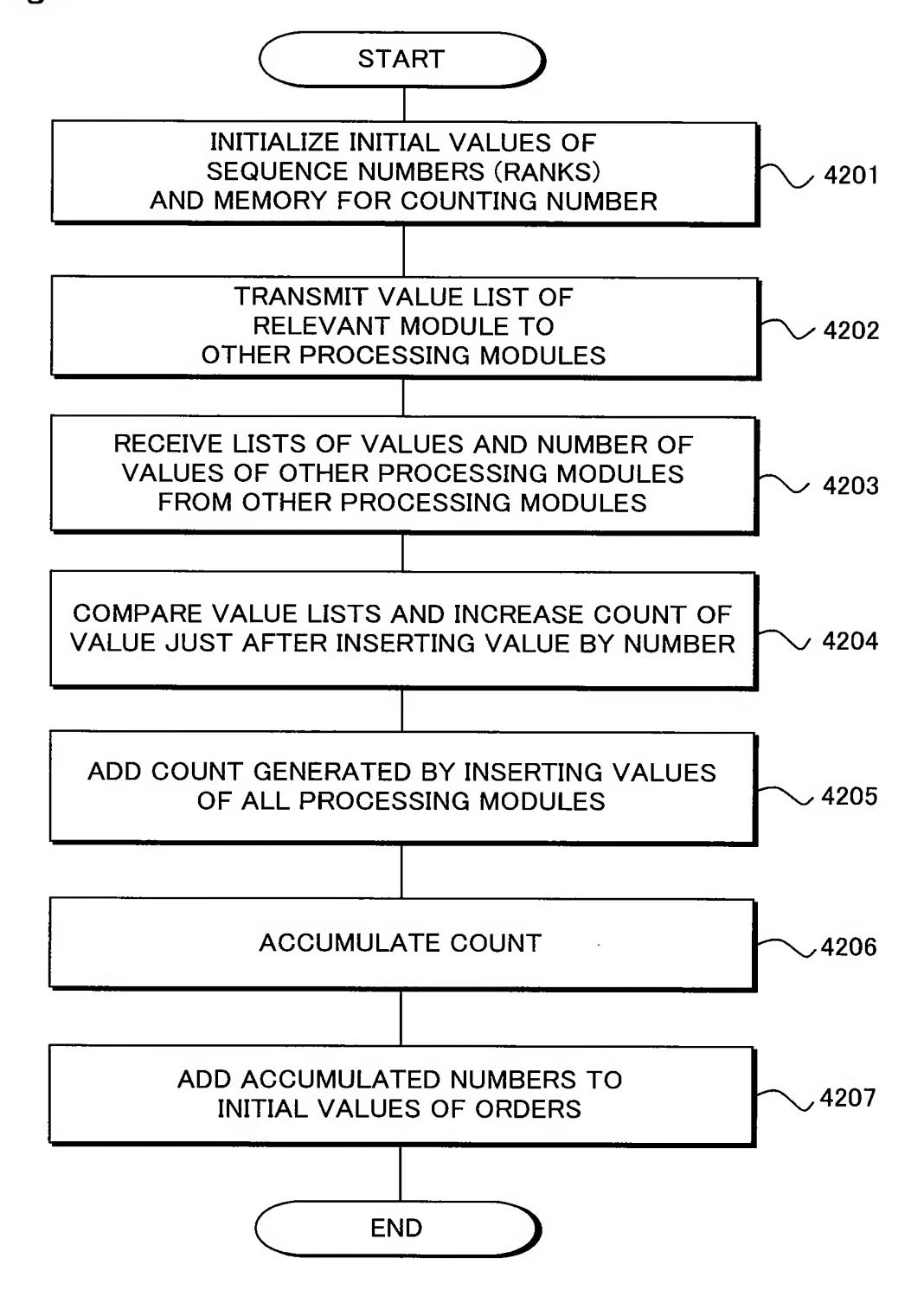
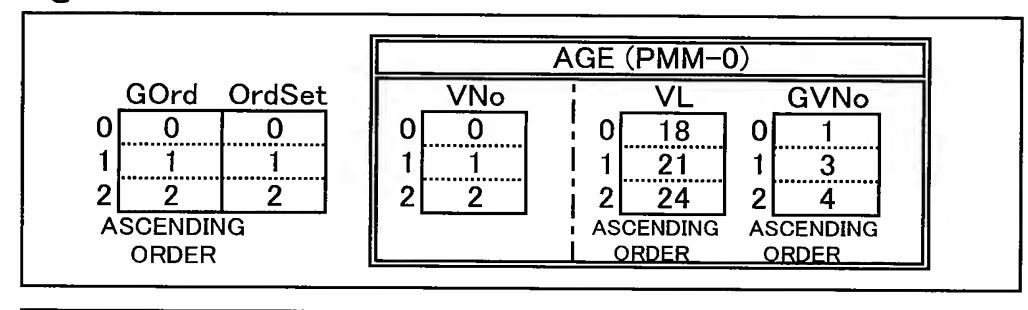
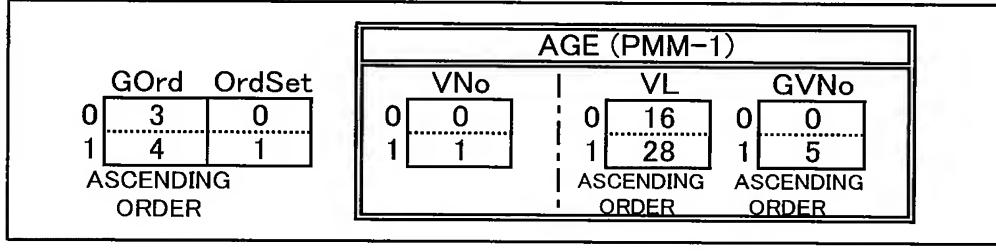
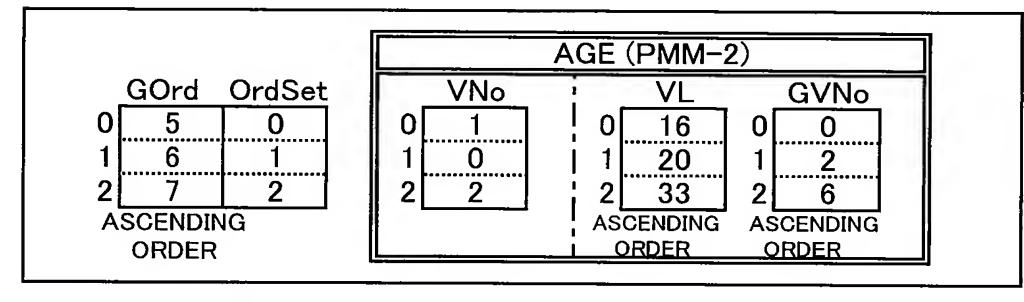


Fig.43







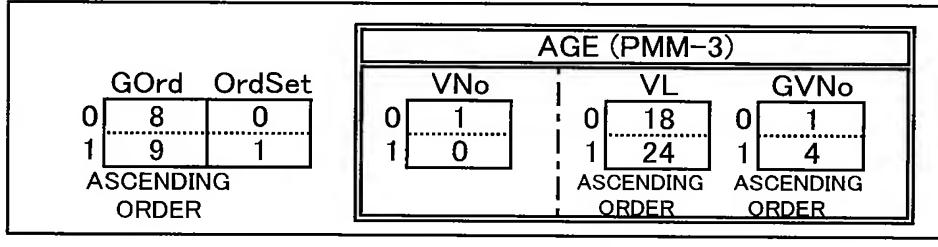


Fig.44

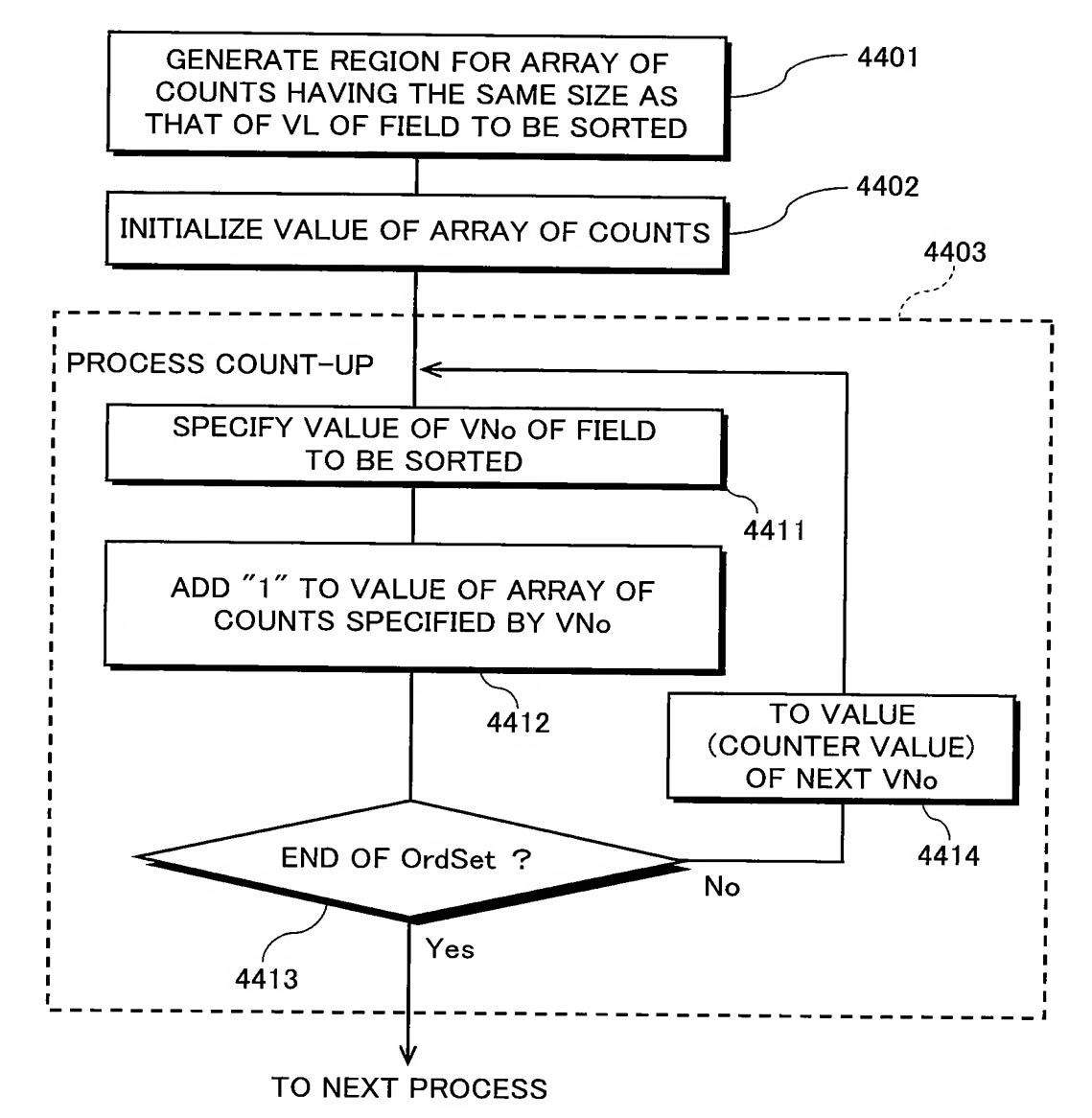
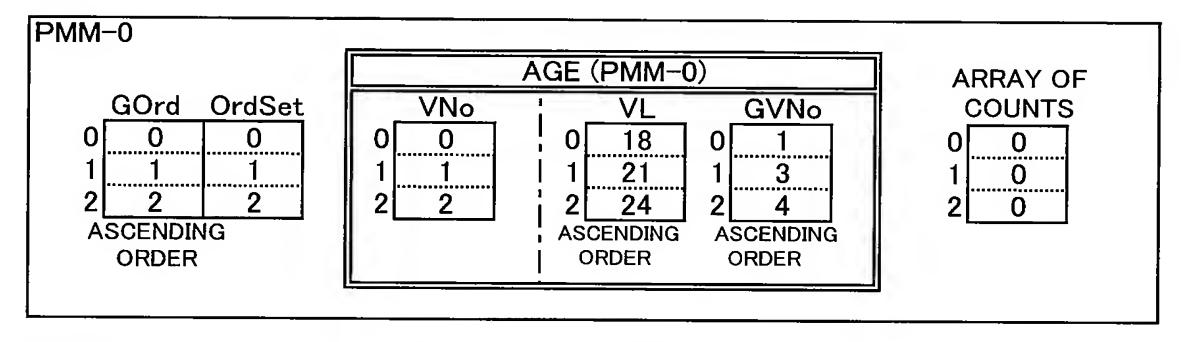
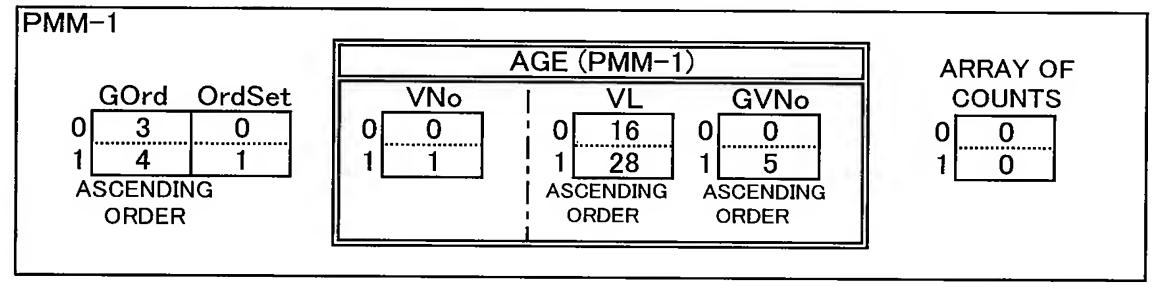
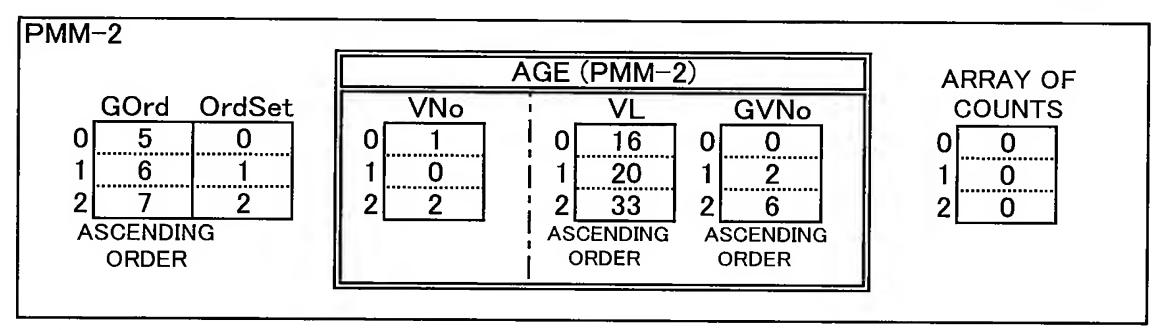


Fig.45







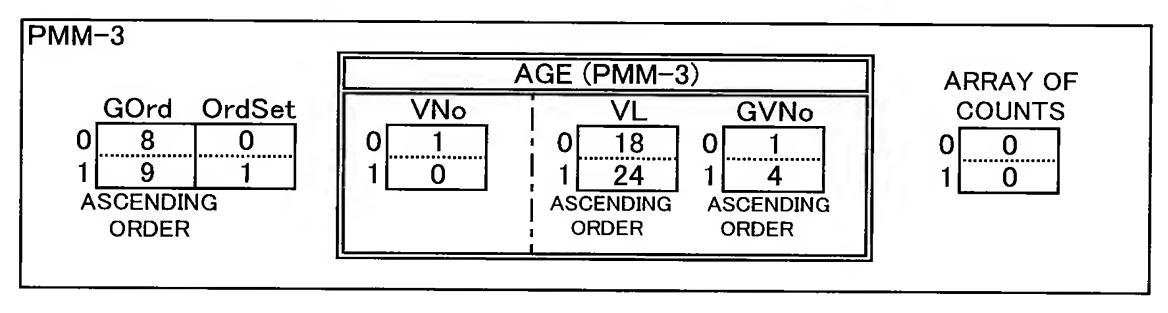
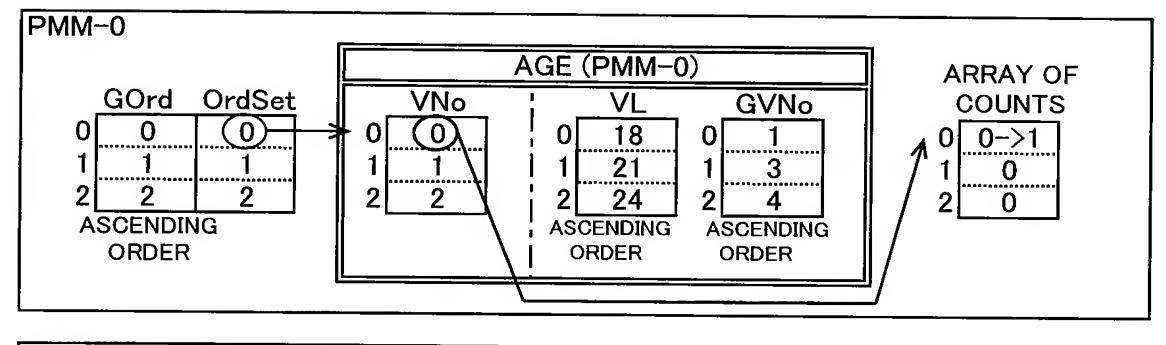
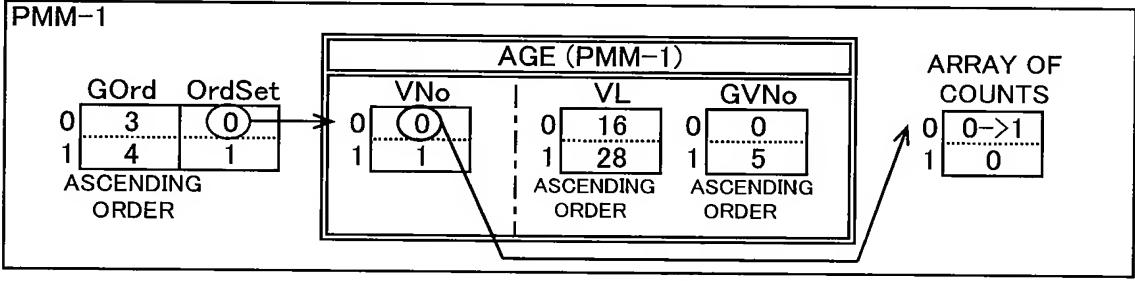
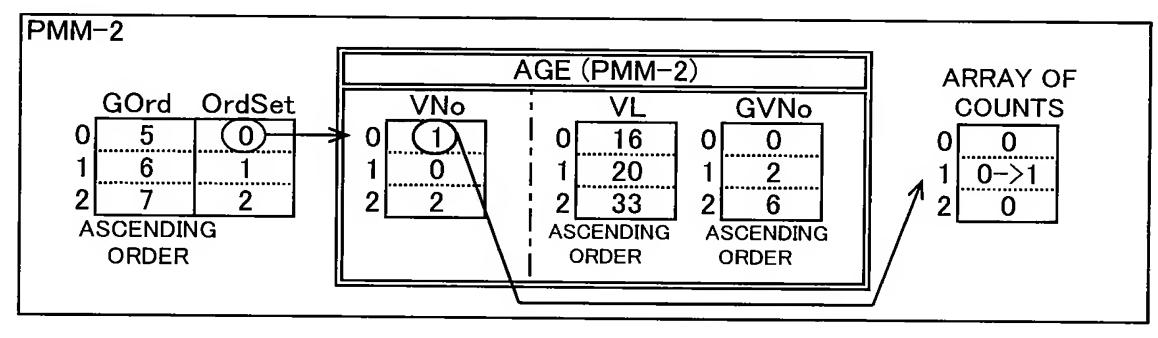


Fig.46







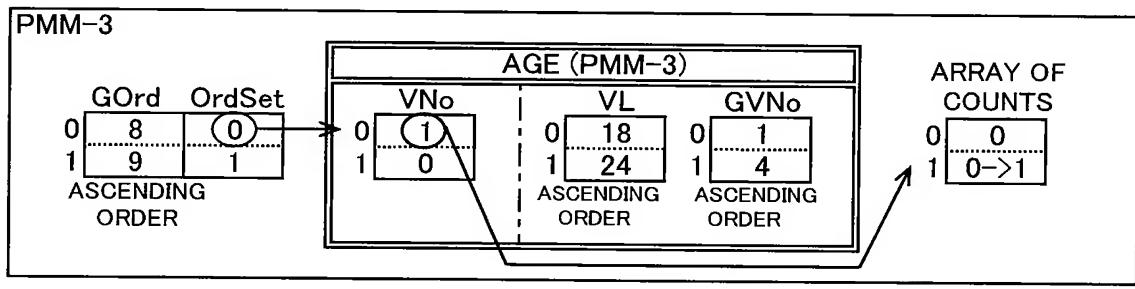
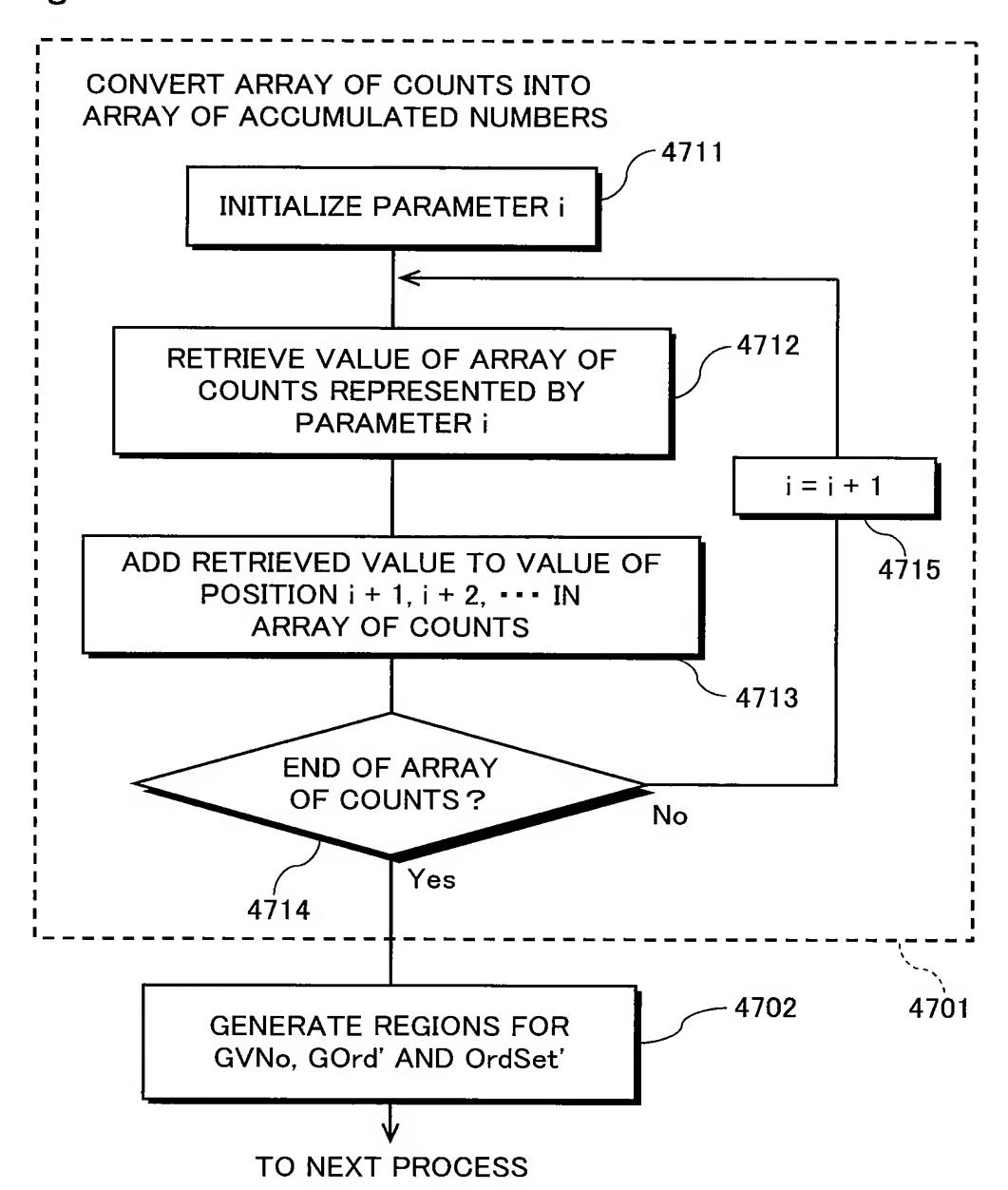
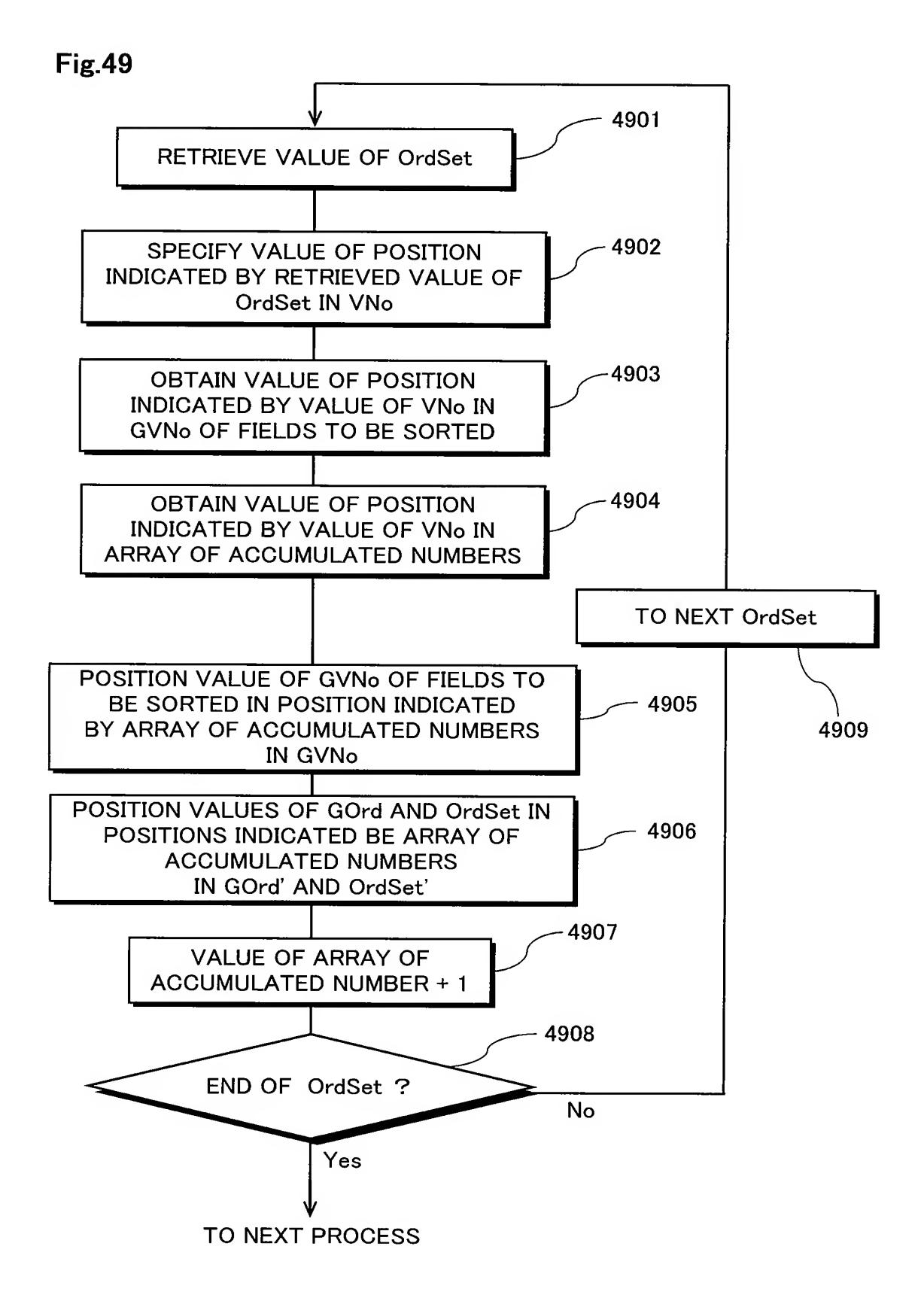


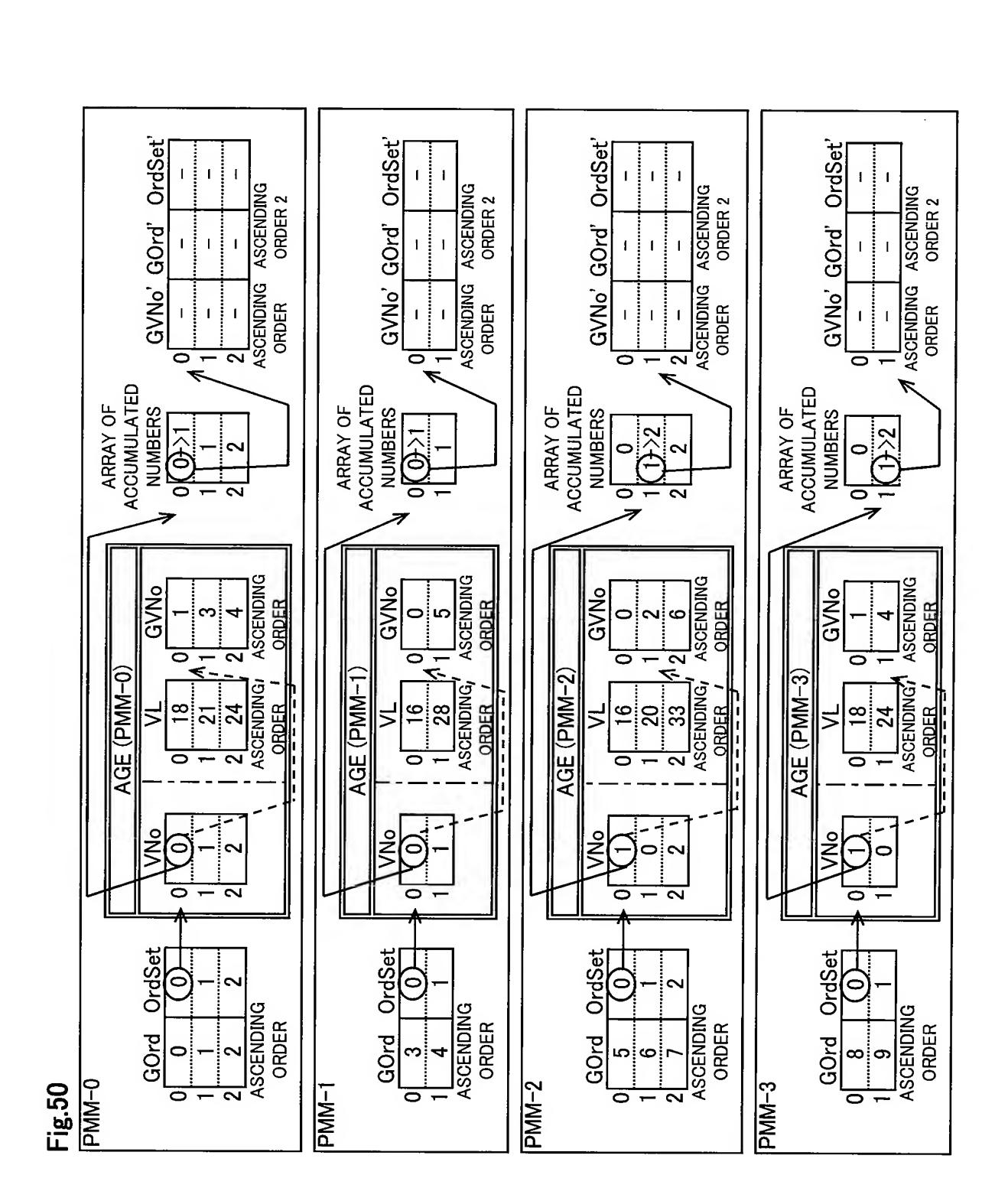
Fig.47

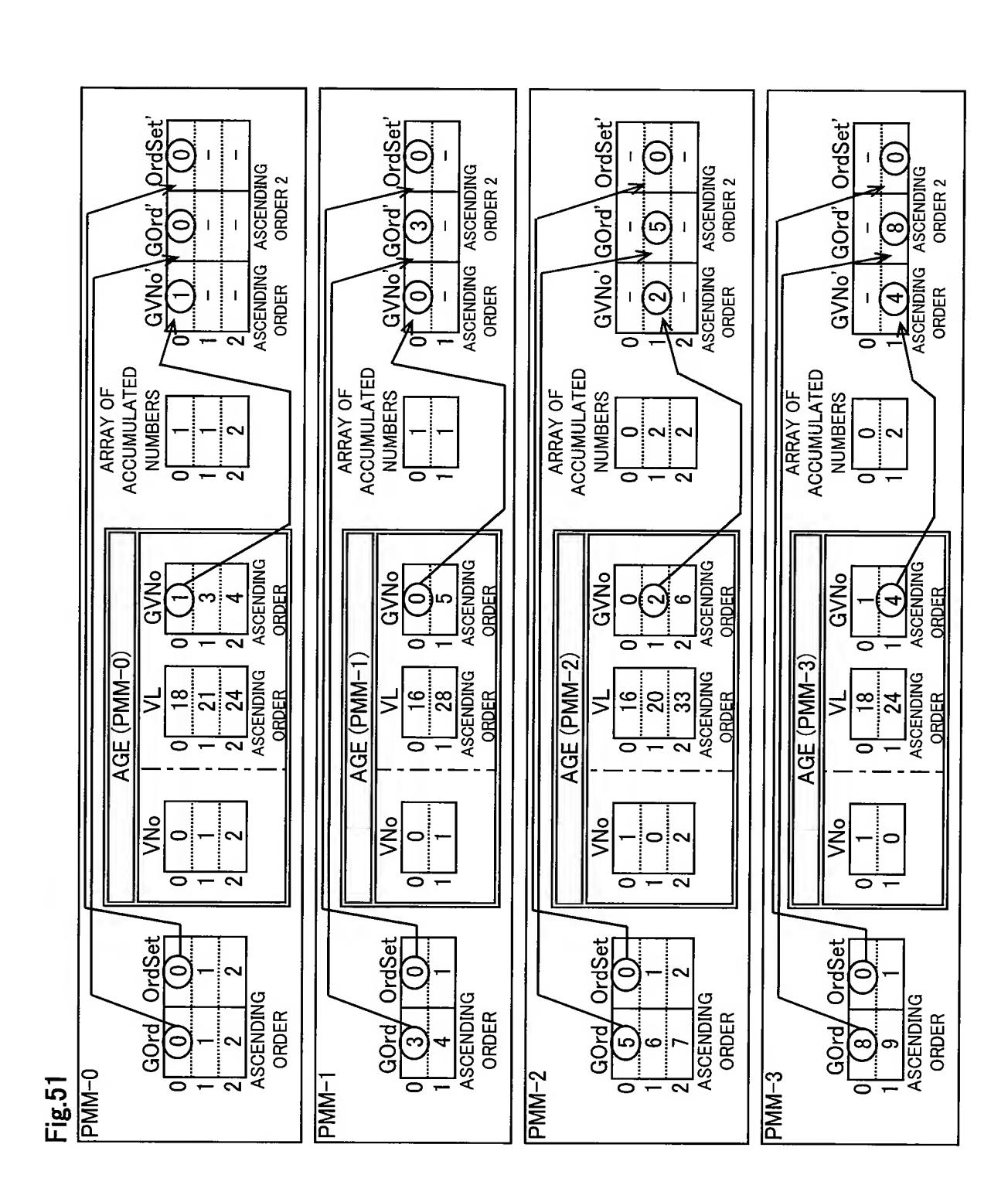


OrdSet OrdSet **OrdSet** OrdSet' GOrd' GOrd' GVNo' GOrd' GVNo' GOrd' GVNo' GVNo. 0 0 0 ARRAY OF ACCUMULATED ACCUMULATED ACCUMULATED ACCUMULATED ARRAY OF ARRAY OF ARRAY OF NUMBERS NUMBERS **NUMBERS NUMBERS** 0 -0 -0 0 0 0 0 ARRAY OF ARRAY OF ARRAY OF ARRAY OF COUNTS COUNTS COUNTS COUNTS 0 0 ASCENDING ASCENDING ASCENDING ASCENDING 2 % N ş 2 ORDER ORDER ORDER ORDER 25 <u>ક</u> ||∂ AGE (PMM-3) 2 AGE (PMM-0) AGE (PMM-2) AGE (PMM-1 0 18 1 21 2 24 ASCENDING 0 16 1 28 ASCENDING 0 18 1 24 ASCENDING ASCENDING ORDER 16 20 33 ORDER ORDER ORDER SN> S ,0 Q, 0 - 2 0 0 OrdSet OrdSet 10-1 OrdSet 1 2 OrdSet 10 -1 0 - 2 ASCENDING ORDER ASCENDING ASCENDING ASCENDING ORDER ORDER ORDER راه هاد GOrd GOrd GOrd GOrd 10 -5 2 7 **ω** 4 PMM-0 Fig.48 PMM-2 PMM-3 PMM-1 0 0 0



F & ...

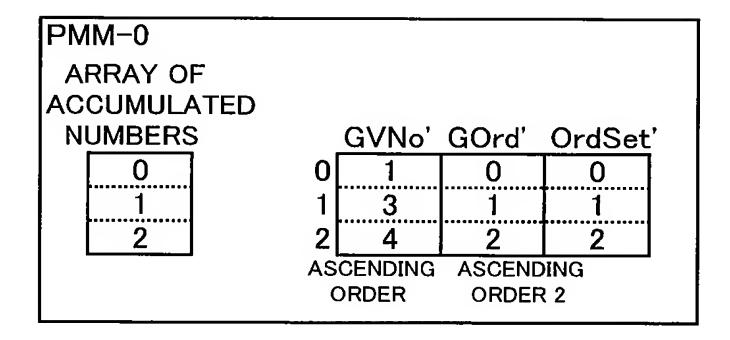


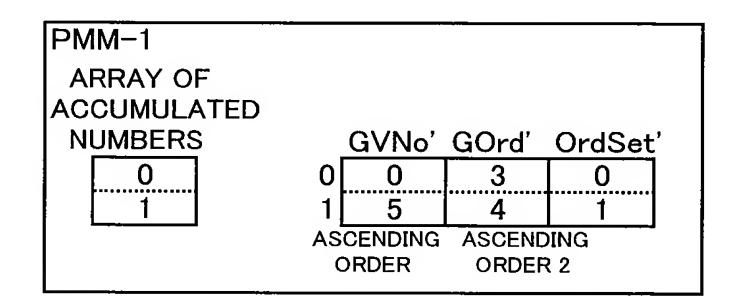


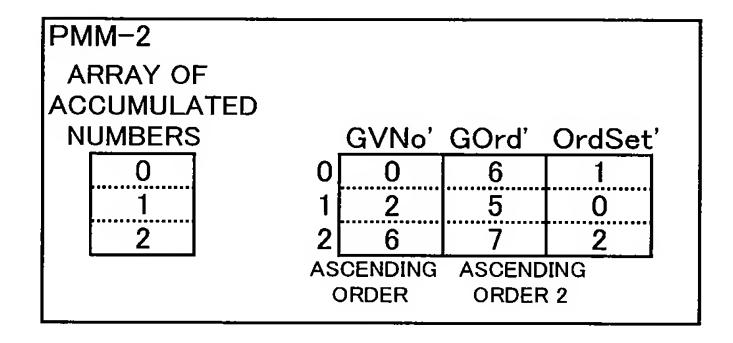
v 1 1 3

Fig.52

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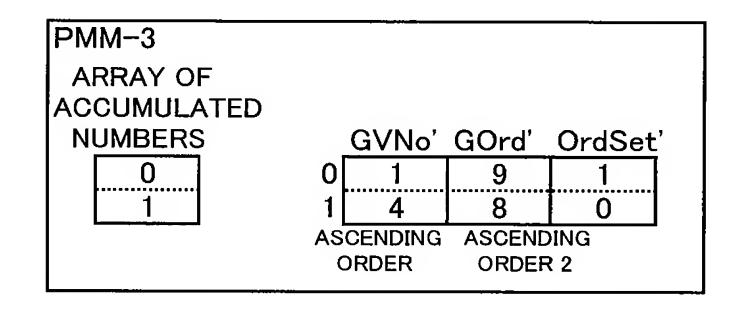


Fig.53A

GENERATION OF ARRAY

OrdSet	GVNo OF SEX	GVNo OF AGE	GOrd
0	1	2	0
1	0	0	1
2	1	1	2

Fig.53B

INITIALIZATION OF RANKS

OrdSet	RANK
0	0
1	0
2	0

Fig.53C

ASSIGNMENT OF RANK 1

OrdSet	RANK	
0	0→1	
11	0	
2	0→1	

Fig.53D

ASSIGNMENT OF RANK 2

OrdSet	RANK	
0	1→2	
1	0	
2	1	

Fig.53E

RESULT

RANK	OrdSet	GVNo OF SEX	GVNo OF AGE	GOrd
2	0	1	2	0
0	1	0	0	1
1	2	1	1	2

Fig.53F

RESULT

RANK	OrdSet	GVNo OF SEX	GVNo OF AGE	GOrd
0	1	0	0	1
1	2	1	1	2
2	0	1	2	0